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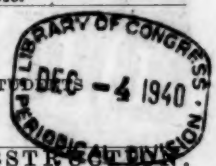


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A SMALL military hospital in this country was unexpectedly presented with the problem of dealing with 500 of the more seriously wounded evacuated from Flanders. In addition to these many "walking wounded" passed through our hands. The casualties arrived in every conceivable condition and after various intervals from the time of their injury. Airmen were admitted within an hour or two of injury, but most of the wounds had been sustained at least 24 hours before arriving in England. Many of the patients had been immersed in the sea for long periods. Some men, wounded in the first onslaught across the Belgian frontier, were not received for four or five days. Not a few had been wounded on two or even three different occasions during their retreat and embarkation under fire. Most wounds were still protected by an unchanged "first field dressing."

Coated with grime and sand, unshaven, exhausted by lack of food and sleep, shaken by many hours of continual bombardment, and with fearful wounds, it was amazing to us how they had survived at all.

All the patients were treated immediately on admission for severe secondary shock. Intravenous saline was needed less often than we expected, since almost every patient welcomed, swallowed and retained large quantities of hot sweet tea. The value of adequate resuscitation treatment with morphine, shock cradles and fluids, for many hours if necessary, cannot be overstressed. Incidentally large numbers of shock cradles were improvised at short notice by the garrison engineer. Blood-transfusions were given in all cases where blood loss was a feature of the injury, their supreme life-saving importance being amply demonstrated. Fortunately we had established our own blood bank under the control of Major W. G. P. Mair, R.A.M.C., before this emergency arose.

### OPERATIVE PROCEDURE

After resuscitative treatment the question of operation arose. Sorting out a convoy of casualties and deciding on the order in which they should proceed to the theatre seemed to be our most difficult and most valuable task. Irrespective of the specific region involved, early operation was essential in many cases to arrest the shock arising from absorption from large traumatised areas. In others it was necessary to control hæmorrhage more permanently than had been possible during the evacuation. A variety of tourniquets were encountered, from the orthodox anchor pattern down to helmet straps, puttees and string. Information regarding time of application was scanty. The tourniquet had undoubtedly saved many lives, but the limb below the compression level in several instances was dead, and in others the tissues were so devitalised that gangrene and severe sepsis had already developed.

The well-known signs and symptoms of gas gangrene placed many cases on our "immediate theatre" list. The two varieties of gas gangrene as described by Frankau (1939a) were encountered. In group 1 (massive gangrene) amputation was performed where possible; in group 2 (group gangrene) affected muscles were widely excised. The wounds were irrigated with hydrogen peroxide and dressed with sulphapyridine in powder form (Ogilvie 1940b). Anti-gas-gangrene serum was administered, and wi combined with sulphapyridine by mouth. Four tablets of M. & B. 693 were given as an initial dose, followed by two tablets four-hourly.

Apart from pressing emergencies operation was most often performed for cleansing the wounds and putting the affected areas in the "position for regaining optimum function." This group included all the fractures and joint injuries. Certain short bullet tracks through the superficial parts of trunk and limbs were completely excised from end to end. Others passing through deeper portions of the body were cleansed at their entrances and exits and incisions were made down to the centre of the tracks for drainage purposes. Some larger bullet tracks obviously could not be excised completely. These wounds we left alone, being encouraged by the fact that many of the patients had such wounds of several days' duration, untreated and in a healing state. The problem of the retained projectile was a difficult one. The account given in the History of the Great War (Surgery, vol. 1, p. 49) of the varying types of wounds caused by different projectiles was confirmed. The relative sterility of wounds caused by high-velocity bullets as contrasted with the heavily infected wounds caused by shell and bomb splinters, carrying in with them fragments of cloth, leather, cigarette packets, cuff links and so on, was well seen in our series and it was speedily confirmed that in many cases damage done to the subcutaneous tissues and muscles was much greater than appeared on the surface.

During the early days of the evacuation the patients were X rayed and the fragments shown on the films were carefully followed down through the enlarged wound. In some R.A.F. casualties with very recent wounds complete removal of bullet debris was performed under the X-ray screen. Valuable advice in the location of foreign bodies was given by Major J. H. Anderson, R.A.M.C., our radiologist. Later, however, this procedure was no longer adopted as a routine. At times, with heavy lists to cope with, only life-saving procedures could be performed. Some patients, plentifully peppered with foreign bodies but otherwise all right, could be left alone. Others, barely well enough to stand operation to control hæmorrhage, could not have borne much exploration, and many foreign bodies were therefore left in situ. In less recent wounds, also, we considered that prolonged exploration for fragments among tissues already reacting to the foreign bodies was of doubtful benefit. Fragments not easily accessible were ignored. We did, however, operate to remove fragments where they were provoking pain, causing pressure on important structures or aggravating sepsis.

Our general technique for wounds of the limbs was almost invariably the same, following closely the teaching of Böhler (1935), Trueta (1939) and Tudor Hart (1939a)—i.e., débridement, packing with gauze soaked in proflavine, and immobilisation in plaster-of-paris. One of us (J. J. M. B.) had the opportunity of following up many of these cases in a general hospital, and in the great majority the results were gratifying. The plaster was removed at the end of several weeks, liberating a foul smell and copious pus in many instances. On wiping away the pus the gauze pack was found partially or completely extruded from a clean granulating wound. Similar results were reported from several E.M.S. base hospitals and by Lieutenant I. P. Spurrell, R.A.M.C., who was also able to follow up some of the cases. It is worth repeating that many of these wounds were several days old before this treatment was instituted. Primary suture was hardly ever attempted, and in many cases stitches inserted obviously to control hæmorrhage had to be removed.

In the arm every effort was made to preserve the shattered limb, amputation being almost entirely avoided. Bone fragments were removed as conservatively as possible, the danger of producing non-union and useless flail joints (Frankau 1939b) being realised. Time was considered well spent in dealing with hand injuries, preserving as much as possible of the wounded part. In the lower limb the Thomas splint was preferred to a Whitman plaster case for fractured femora in order to save valuable time. Similarly in a shocked patient with a gunshot wound of the spine the application of a spinal plaster jacket was found to take too long to be practicable.

A simple dorsal plaster shell made of several stout plaster slabs is advocated in such cases prior to their transfer to a neurological centre. For fractured femora skin strapping with fixed extension and Spanish windlass fixation was found preferable to skeletal extension with the accompanying risk of further sepsis (Weddell 1939). In the field the anklet method of counter-extension with the Thomas splint (Lyburn 1940) would probably be preferable to the clove hitch so often used. Several of our cases had severe pressure grooves round the ankle with signs of commencing necrosis of the skin of the dorsum of the foot, caused by the clove hitch. Amputations were required in several cases and were resorted to more often than in the upper limb. Some traumatic amputations required trimming up. Short flaps, as advocated by Max Page (1939), were preferred to the crude guillotine, and as few sutures as possible were used owing to the risk of producing gangrene (Tudor Hart 1939b).

### WOUNDS OF THE CHEST AND ABDOMEN

From our experience the list of indications and contra-indications for operations in wounds of the thorax given in the History of the Great War (Surgery, vol. 1, p. 401) could not be improved on. They are:

1. A ragged wound of the soft parts.
2. Compound fracture of ribs.
3. Bleeding from the parietal wound which continued when the wound was uncovered for examination.
4. Severe pain (often the result of indriven splinters of rib scratching the chest wall with each respiratory movement).
5. An open wound of the thorax, through which air was pumped in and out of the pleural cavity, a so-called "sucking" wound.
6. Crushed ("stove-in") chests, with extensive laceration of the lung by displaced bone.
7. Valve pneumothorax.
8. Large simple hæmothorax in the state of a massive clot.
9. Acute infected hæmothorax.
10. Abdomino-thoracic wounds with injury of the diaphragm, especially on the left side.
11. Retention of a large foreign body.

Many of our cases were at least 48 hours old and in few of these was operation considered. Improvement after closure of open "blowing" wounds of the chest was particularly gratifying (Gask 1939).

The progressive deterioration of patients with untreated abdominal wounds (Gordon-Taylor 1939) was unfortunately well shown by our patients. All abdominal wounds require early exploration. None of our cases was seen within 24 hours and our mortality was consequently heavy. The tendency of buttock wounds to involve abdominal contents was again proved true in our series. Well-marked "peritonism" without damage to hollow viscera or gross intraperitoneal hæmorrhage was met with in several wounds of the buttock and pelvis. Thorough exploration of the wound track avoided unnecessary laparotomy in these cases.

### WOUNDS OF THE HEAD AND EYES

Many severe head injuries, most of them of more than 24 hours duration, passed through our hands. The optimum period for operation had unavoidably been passed, and the patients were in a very unfavourable state (Jefferson 1939). Under these circumstances nothing was done beyond local cleansing, and the patients passed on to a neurological centre. Several cases exhibiting pressure symptoms, and in which the gap in the skull was small, were further decompressed.

Eye injuries were treated by Major J. L. Hart, R.A.M.C., the hospital ophthalmic surgeon. On the whole the incidence was low. Three types of eye injuries were observed.

1. *Penetrating injuries.*—In all cases the damage was so extensive that the globe had to be removed. Foreign bodies remaining in the orbit were easily removed, but no intensive search was made for those which had penetrated the apex of the orbit.

2. *Corneal foreign bodies.*—These were usually multiple; they were of varying depth and often associated with subconjunctival foreign bodies. The deep foreign bodies were extremely difficult to remove with no magnet available.

3. *Conjunctivitis.*—In cases associated with facial burns, where the mobility of the eyelids was temporarily lost owing to the tannic-acid coagulum, a secondary bacterial infection developed. Coagulation of burned eyelids was soon abandoned and the lids and surrounding skin treated with saline only. Early Thiersch grafting should be adopted when there is danger of ectropion. Chemosis, due to the explosion of incendiary bombs close by, rapidly subsided under saline irrigations.

### BURNS

Twenty extensive second and third degree burns were dealt with. Eight sailors were admitted within 6 hours of their injury; the others at periods ranging from 24 to 96 hours after the burns. All cases exhibited secondary shock or toxæmia on admission. Many had more than half the body surface burned, and were complicated by gunshot wounds. Others had suffered from immersion in the sea.

The routine treatment followed the lines described in detail by Dennison (1939). After appropriate shock treatment with electric cages and morphine the extreme urgency of these cases gave them precedence over many other emergencies for the theatre. Under gas-and-oxygen anæsthesia the traumatised area was rapidly and gently cleansed; 1% gentian violet was then applied and the area was dried with a hair drier. This was followed by the application of tannic acid 10% and silver nitrate 10% (Bettmann 1935). The hair drier was again used. A further application of gentian violet was made, and the patient was returned to bed and again placed under an electric cage. Methylated ether and 1% gentian violet in spirit were applied to the coagulum four-hourly. The tendency to contracture of the joints, particularly the fingers, was counteracted by the application of plaster slab splints wrapped in white lint. Eucortone and desoxycorticosterone acetate proved their value in the treatment of the severe shock and toxæmia in many of these cases. The synthetic corticosterone (Percorten and D.O.C.A.) gave more striking results than the suprarenal extract, and dosage was controlled by means of detailed charts showing hourly pulse, temperature and respiration readings, frequent blood-pressure levels, and the clinical condition of the patients. The usual dose was 10 mg., four-hourly. Fluids and glucose were administered in large quantities by all available routes.

The mortality of the burn cases was 25%, and in view of the extent of the injuries and condition of the patients in hospital we consider this highly gratifying. Several patients were retained until they were well on the road to recovery, with fresh healthy epithelium and without need for grafting. These cases well repay unceasing vigilance and care.

### ANÆSTHESIA

Three operating tables were in use in the theatre at the same time, but only one gas-and-oxygen apparatus (Boyle's) was available. As far as possible, therefore, the more seriously ill and complicated cases were anæsthetised with gas and oxygen, the remainder being anæsthetised with the open mask and drop bottle. Economy in gases was necessary owing to the shortage of cylinders. The gas machine was fitted with a three-way expiratory valve, and as soon as induction was completed the valve control was pushed over to the total rebreathing position and then opened the merest fraction, so that a slight head of pressure was created in the reservoir bag, together with a certain unmeasured amount of rebreathing. Using the valve in this way it was possible to reduce the flow of fresh gases to a minimum.

The effect of the anæsthetic on a severely shocked, exhausted and exsanguinated patient was often remarkable. In the early induction period the patient usually reacted as one might expect in a normal muscular adult; then, with little warning, he would quickly descend into the deepest stage of anæsthesia. This was especially noticeable in patients with penetrating wounds of the chest. Three or four breaths of pure nitrous oxide during induction was sufficient to put the patient into the fourth stage of anæsthesia, and a rapid increase of oxygen was urgently necessary. Thereafter it was found that satisfactory anæsthesia could be maintained with an extraordinarily high percentage of oxygen (80–90%). The inefficiency of the Boyle's apparatus caused some anxiety since accurate control of the mixture was impossible.

With such high percentages of oxygen a McKesson machine, with its certain and rapid control of gas mixture, would have been invaluable. The lack of positive-pressure adjustment was also a great handicap in these cases. An attempt was made to build up pressure in the lungs by closing down the expiratory valve, and turning on the gas taps hard. This could not be done without altering the percentage mixture of gases, with consequent fluctuation in the level of anæsthesia. The machine was equipped only with a water-bottle flow-meter, so that it was almost impossible to regain a satisfactory mixture rapidly once the adjustment had been altered.

Considerable use was made of Magill's intratracheal tubes passed usually by the indirect method through the nose. In penetrating wounds of the chest the catheter was not used, since it was felt that the coughing caused by the insertion of the tube might precipitate or increase hæmorrhage. Two cases demonstrated the danger of indiscriminate passing of intratracheal tubes. These men had sustained a through and through wound of the jaw, involving the root of the tongue. There had been severe hæmorrhage, but this had ceased before they were admitted to the hospital. After induction indirect catheterisation failed, owing to the softness of the tubes. On passing the laryngoscope there was severe hæmorrhage from the tongue before the catheter and packing could be inserted, allowing a quantity of blood to be inhaled. In such cases where there is danger of oropharyngeal hæmorrhage it would probably be advisable to perform tracheotomy, as is done by Japanese surgeons (Weddell 1939), and to administer or continue anæsthesia through the tracheotomy tube.

### CONCLUSIONS

A small military hospital had unexpectedly to admit 500 seriously wounded men. The standard of work in such an emergency has to be adjusted to the rate of influx of casualties. The insertion of skeletal extension wires and pins, for example, which would perhaps have been possible in cases early in the list, was out of the question later, in a theatre dealing with sepsis and gangrene.

The depressing reality of Ogilvie's classification of wounded into "Immediate," "May be ready soon" and "Too late" has to be faced. We graded our cases and wrote on the field cards as follows. Changes were, of course, inevitable, but this classification proved satisfactory.

(*a*) Operation + + + (immediate theatre). These cases included burns, sucking chests wounds, early head wounds and penetrating abdominals.

(*b*) Operation + + (for early theatre). These included severely shocked patients needing thorough resuscitative treatment and limb wounds with fractures.

(*c*) Operation + (operation required, but yielding precedence to actual life-saving procedures). These included cases needing colostomy, and non-urgent foreign bodies.

(*d*) Operation — (not for operation in a C.C.S., or beyond surgical hope).

The modern plaster technique for treatment of gunshot wounds is more simple, rapid, and efficacious than the old method of continuous irrigation. It is therefore doubly useful in the conditions of a casualty clearing station; in our series not a single case was treated by the Carrel-Dakin method.

We endorse the recommendation of Japanese surgeons of preliminary tracheotomy for wounds involving the oropharynx.

Catgut was used sparingly and only for main vessels. No nerve or muscle was sutured. Close apposition of wound surfaces was rarely if ever attempted.

The great importance of the preliminary treatment of shock, with the administration of blood when necessary, was clearly demonstrated.

The modern treatment of burns amply demonstrated its value.

We wish to express our thanks to Colonel J. E. Boyd, M.C., commanding officer, for permission to publish this memorandum.

### REFERENCES

Bettman, A. C. (1935) *Northwest Med.* **34**, 37.
Böhler, L. (1935) The Treatment of Fractures, Bristol.
Dennison, W. M. (1939) *Lancet*, **2**, 1107.
Frankau, C. (1939a) *Brit. med. J.* **1**, 989.
— (1939b) *Ibid*, **2**, 27.
*(Continued at foot of next column)*

# RADIOGRAPHY IN POSTOPERATIVE ILEUS

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WHEN a fit man is suddenly taken ill with intestinal colic, vomiting, absolute constipation, and distension, the diagnosis of intestinal obstruction is clear and we seldom hesitate to open his abdomen without delay. In many cases, however, the syndrome is incomplete and operation may be withheld too long. Surgeons are therefore coming to rely on the valuable diagnostic help of plain radiograms of the abdomen—i.e., films taken without the use of contrast media.

The basis of the radiological diagnosis of ileus is that gas and fluid, recognisable in the plain radiogram, accumulate in the intestine above the obstruction. In the erect position the association of gas and fluid produces a series of fluid levels; in the supine position the film shows the amount and distribution of gas in the bowel. The pattern and size of the distended loops confirm the presence of obstruction and indicate its site. Those unfamiliar with the technique are apt to condemn the method as too disturbing for a patient ill with intestinal obstruction; but, if the patient is unfit to leave his bed, the radiograms may be taken with a portable apparatus, and he is less disturbed than he would be by an enema.

If the clinical diagnosis of simple intestinal obstruction is often difficult, that of postoperative obstruction is so always, and the decision to operate is harder still to make. The radiological signs of stagnation of the contents of the bowel in postoperative obstruction are just as clear as in obstruction not associated with a recent operation, but their bearing on prognosis and treatment is by no means the same.

This paper is part of a recent study of the radiological diagnosis of intestinal obstruction. Of 75 cases treated at the Middlesex Hospital 18 belong to the postoperative group; most had peritonitis and developed symptoms of the type of ileus usually called paralytic. The plain radiograms were a great help in assessing individual cases, and analysed as a group they clarified our ideas of postoperative ileus in association with peritonitis.

### ADYNAMIC ILEUS

Whenever the abdomen is opened, the motility of the gastro-intestinal tract and, to a lesser extent, its secretory and absorptive capacity are disturbed, producing adynamic ileus. This condition is nearly always transient, subsiding, according to Ochsner,[1] in six to twelve hours, and needs no special treatment; but, when there is peritonitis, especially if it is due to bacteria, adynamic ileus persists, and the belly may become greatly distended. All the signs of intestinal obstruction are present save one: there is no peristalsis. This makes diagnosis easy and puts out of court any direct attempt to relieve an "obstruction" by operation. The same applies to the rare instances of severe and persistent adynamic ileus uncomplicated by peritonitis.

In our experience, however, most cases causing anxiety after operation are not of this type. On the contrary, the possibility of focal obstruction needing

1. Ochsner, A. *Amer. J. Roentgenol.* 1937, **37**, 433.

MAJOR BROWN AND OTHERS: REFERENCES (*continued*)

Gask, G. E. (1939) *Ibid*, **1**, 1043.
Gordon-Taylor, G. (1939) The Abdominal Injuries of Warfare, Bristol.
Jefferson, G. (1939) *Brit. med. J.* **2**, 347.
Lyburn, R. St. J. (1940) *Ibid*, **1**, 934.
Ogilvie, W. H. (1940a) *Lancet*, **1**, 935.
— (1940b) *Ibid*, p. 975.
— (1940c) *Ibid*, p. 1019.
Page, C. Max (1939) *Brit. med. J.* **2**, 77.
Trueta, J. (1939) *Ibid*, **1**, 1073.
Tudor-Hart, A. (1939a) *Ibid*, p. 1099.
— (1939b) *Ibid*, p. 1146.
Weddell, J. M. (1939) *Ibid*, p. 785.

TABLE I—POSTOPERATIVE CASES OF SUSPECTED MECHANICAL OBSTRUCTION IN WHICH SERIOUS OBSTRUCTION WAS EXCLUDED BY PLAIN RADIOGRAPHY

| Case | Diagnosis | Operation | Suspected post-operative complication | Days after operation | Radiological finding | Result |
|---|---|---|---|---|---|---|
| 1 | Carcinoma of descending colon; Paul's resection | Closure of colostomy | Obstruction at site of closure | 15 | No obstruction, much fæces in colon | Settled down |
| 2 | Duodenal ulcer | Partial gastrectomy, anastomosis in Y | Obstruction of jejunal loop | 3 | No obstruction of loop, colonic stasis | ,, |
| 3 | Carcinoma of pelvic colon | Laparotomy, cæcostomy | Obstruction unrelieved | 13 | No obstruction | ,, |
| 4 | Pyloric stenosis | Gastrojejunostomy | Obstruction of jejunal loop | 14 | ,, | ,, |
| 5 | ,, | ,, | ,, | 3 | ,, | ,, |
| 6 | Chronic metritis; oöphoritis | Hysterectomy, oöphorectomy, injury to loop of ileum | Obstruction of ileum | 11 | Fluid levels, grade II; small bowel distended, grade II; gas in colon | |
| | | | | 12 | Moderate degree of ileal obstruction persists | |
| | | | | 18 | Signs of ileal obstruction gone | ,, |

TABLE II—PREOPERATIVE PERITONITIC OBSTRUCTION IN ACUTE APPENDICITIS

| Case | Temperature | Findings at operation | Operation | Radiological findings | | Colon | Duration of disease (days) |
|---|---|---|---|---|---|---|---|
| | | | | Levels, grade | Small-bowel distension, grade | | |
| 7 | 101·6° F. | Perforated appendix abscess | Appendicectomy, drainage | II | I | Traces of gas | 5 |
| 8 | 101·0° F. | Appendix sloughed off and lying loose in abscess cavity, spreading peritonitis | Slough removed, drainage | Not radiographed in erect position | II | A little gas in transverse colon | 14 |
| 9 | 98·0° F. | Greatly reddened and distended small bowel, scanty thin turbid fluid; P.M. perforated appendix | Jejunostomy, drainage | ,, | IV | Colon empty, cæcum 5 cm. | 11 |
| 10 | 99·3° F. | Perforated appendix, appendix abscess, spreading peritonitis | Appendicectomy, drainage | II | II | Traces only | 7 |

TABLE III—POSTOPERATIVE PERITONITIC OBSTRUCTION (DIFFUSE AND MIXED TYPES)

| Case | Final diagnosis | Operation | Radiological findings | | | Time after operation | Result |
|---|---|---|---|---|---|---|---|
| | | | Levels, grade | Distension | Colon diameter (cm.) | | |
| 11 | Carcinoma of recto-sigmoid junction, postoperative peritonitis | Paul's resection | II | III | Traces of gas | 24 days | Laparotomy and division of adhesions 45 days after operation. Recovered. |
| 12 | Perforated appendix, spreading peritonitis | Appendicectomy, drainage | II | II | Cæcum 4·0, traces of gas elsewhere | 26 ,, | Settled |
| 13 | Tubo-ovarian abscess, right and left | Salpingo-oöphorectomy, drainage | II | I | Cæcum 5·5; transverse 3·7; descending 2·6 | 21 ,, | |
| 14 | Appendix abscess | Appendicectomy, drainage | II | III | Cæcum 3·5; traces in rest of colon | 31 ,, | ,, |
| | | | III | IV | Cæcum 6·0; descending 2; pelvic 3 | 32 ,, | |
| 15 | Ulcerative colitis, postoperative peritonitis | Right hemicolectomy | II | II | No gas in remaining portion of colon (old ileostomy present) | 7 ,, | Died 10th day |
| 16 | Appendix abscess, peritonitis | Appendicectomy, drainage | II | III | Colon not dilated | 7 ,, | Settled |
| 10 | Appendix abscess, peritonitis | Appendicectomy, drainage | III | III | Cæcum 6·0; pelvis 3·5 | 7 ,, | Ileostomy 11th day. Recovered |
| | | | I | ? I | Poor radiogram, ? fæces | | |
| 17 | Appendix abscess | Appendicectomy, drainage; autopsy (pelvic abscess) | II | II | Traces of gas in cæcum and colon, no excess of fæces | 8 months | Died, 9½ months |
| 18 | Traumatic rupture of ileum, peritonitis | Suture of ileum, drainage of peritoneum | III | III | Some gas in colon, up to 4·0 | 1 day | Settled |
| | | | III | III | Traces of gas in cæcum, much fæces in colon, up to 5·5 | 4 days | |
| | | | N.R. | 0 | Small amount of gas | 5 ,, | |

N.R. = Not radiographed in erect position.

an urgent operation often arises and presents one of the most difficult problems in surgery. It is here that plain radiograms are a great help.

### TYPES OF POSTOPERATIVE OBSTRUCTION

*Focal obstruction.*—The site of the obstruction is precise—e.g., in the efferent loop of a gastrojejunostomy or at an entero-anastomosis. When vomiting and distension arise a few days after intestinal suture or repair, obstruction at the line of suture is to be suspected. A second operation is notoriously difficult and dangerous. Postponed until the clinical signs are unequivocal, it may be too late; performed earlier it may be unnecessary. Table I summarises 5 cases in which vomiting and distension developed some days after operation, obstruction was suspected but excluded on radiological evidence, a second operation was not done, and all the patients recovered. In case 6 (see below) there was distinct radiological evidence of obstruction.

*Diffuse or peritonitic obstruction*, often loosely named "paralytic," is usually infective and is the commonest kind of postoperative obstruction. We have included 4 preoperative cases (table II), because they throw light on the origin of diffuse obstruction. All were cases of acute appendicitis of five or more days' standing, with perforation; in each of them the radiograms showed signs of obstruction of the small bowel, but the colon contained only traces of gas, except in case 9, whose cæcum was slightly distended (diameter 5 cm.).

TABLE IV—COMPARISON OF AMOUNT OF OBSTRUCTION AND DISTENSION IN FOCAL AND IN DIFFUSE OBSTRUCTION

| Type of obstruction of small bowel | No. of cases | Fluid levels (av. no.) | Distension (av. diam.) |
|---|---|---|---|
| Mechanical .. .. .. | 11 | 2·4 | 2·4 cm. |
| Peritonitic { Preoperative .. | 4 | 2·0 | 2·25 cm. |
| Peritonitic { Postoperative .. | 9 | 2·2 | 2·4 cm. |

In 9 cases of postoperative peritonitic obstruction (table III) the films demonstrated distinct obstruction of the lower part of the small bowel; large-bowel shadows were a little more evident than in similar cases of obstruction not associated with operation but were never gross and were usually within average limits. Clearly in postoperative obstruction plain radiograms have the same diagnostic and localising significance as in other forms of intestinal obstruction. Positive radiological signs are not in themselves an indication for operation any more than are abdominal distension, vomiting, and constipation.

To compare the degree of obstruction and distension of the small bowel in this series, as estimated radiologically, with the findings in a series of cases of localised obstruction of the small bowel unassociated with recent operation, we have counted the fluid levels and graded them as follows: 1–3 levels, grade I; 4–8, grade II; 9–12, grade III; more than 12, grade IV. Distended loops of small bowel are also graded: up to 2·5 cm. in diameter, grade I; 2·5–4 cm., grade II; 4–5 cm., grade III; more than 5 cm., grade IV. Comparison according to grade shows no difference in the two series (table IV), but the prognosis is vastly different. Few patients with ordinary mechanical obstruction of the small bowel would survive without operation, yet 6 of 9 in the postoperative series recovered without recourse to surgery.

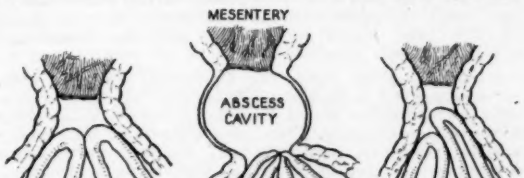


FIG. 2—Diagram showing the mechanical effect of collapse of an abscess cavity: (*a*) abscess forming between mesentery and coils of small intestine; (*b*) fully formed abscess cavity causing obstruction of the intestine; (*c*) coils rendered patent by evacuation of the abscess cavity.

*Mixed obstruction*, a combination of focal and diffuse, such as may be seen after entero-anastomosis with peritoneal soiling. Narrowing of the lumen of the bowel at the site of suture may be caused by kinking due to faulty sewing or to unsatisfactory lie of the coil but is probably more often due to inflammatory swelling taking some hours to develop and some days to subside.

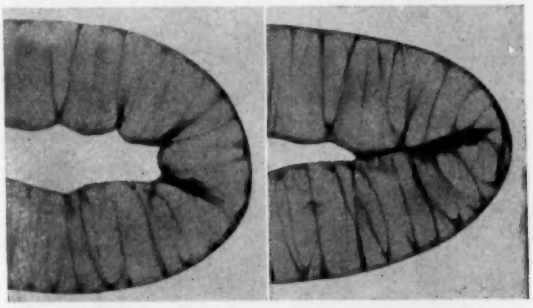


FIG. 1—Coils of jejunum experimentally distended, (*a*) partially, (*b*) completely, to show the acute kinking and consequent obstruction caused by complete distension.

Peritonitis is a common accompaniment; it may be established before operation, as in case 18 (see below), follow contamination at operation, or develop later if the suture line leaks.

Stagnation of intestinal contents is usually thought to be due to paralysis of the wall of the bowel, caused by bacterial toxins acting directly on the muscles or the motor nerves. No doubt paralysis is the essential factor at first, but more powerful elements soon come into play and are responsible for the persistence of signs of obstruction, especially in a patient whose condition causes no great anxiety for three or four days after operation, but who then becomes progressively distended, begins to vomit, has an increased pulse-rate, and is gravely ill. The abdomen is tense, somewhat tender, and tympanitic on percussion; little flatus and less fæces are passed; and there is constant discomfort. Nevertheless the original peritonitis often appears to be subsiding, the temperature is lower, and leucocytosis is less. From time to time, besides the persistent discomfort from distension, there are fleeting sharp pains that become more frequent, and the stethoscope reveals peristalsis, the sounds having a characteristic tinkle. There is no longer general paralysis of the bowel, yet this is just the kind of case that is persistently labelled "paralytic ileus." True, local paralysis may persist; colic may be caused by contractions of the bowel trying to force its contents past an inactive segment, much as it does in localised mesenteric thrombosis.

Many patients at this stage have a localised intraperitoneal abscess, and it may be that segments of bowel in the wall of the abscess are poisoned and paralysed; this is simply an extension of Handley's theory of ileus duplex. Since patients are nursed in Fowler's position, the commonest site for a residual abscess is the pelvis; coils of ileum and the pelvic colon may be affected by the pus. Plain radiograms show, however, that the colon, unlike the small bowel, is seldom conspicuously dilated. The average dilatation of the small bowel is the same as in localised mechanical obstruction. In a series of 30 cases of mechanical localised obstruction of the colon the average diameter of the cæcum was 9·5 cm.; whereas in the peritonitic postoperative cases the maximal diameter was 6 cm., the average being 4·7 cm., and in 2 of 10 unselected patients without demonstrable disease the cæcum measured 4·5 cm.; in 6 cases gas and fæces were present in such small quantities that they could not be measured. Therefore the theory of paralysis is untenable as a complete explanation.

At least four mechanical factors are at work in these cases: (1) the fibrinous peritoneal exudate rapidly becomes sticky and glues the coils of bowel together; (2) the coils of bowel, as they dilate, become cramped for room in the abdominal cavity and can no longer

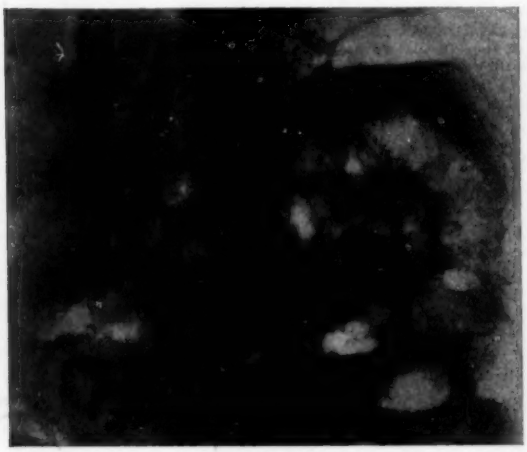

FIG. 3—Case 18: plain radiogram of abdomen in the erect position, showing several fluid levels.

FIG. 4—Case 18: plain radiogram of abdomen in the supine position, showing many distended coils of jejunum and ileum.

writhe freely, with the result that kinks are not reduced and adhesions become fixed; (3) when the bowel becomes distended beyond a critical point, the contractile force of the circular fibres diminishes; and (4) when a coil of tightly distended bowel is bent upon itself, an occlusive kink appears at the bend (fig. 1). The combination of these factors, with or without a "toxic paralytic" element, seems adequately to explain progressive obstruction. Any factor, spontaneous or therapeutic, that overcomes one element in the vicious circle will diminish all and turn the tide in the patient's favour. Once this has happened, recovery is often rapid (cases 6, 10, and 13). Dramatic improvement often takes place after the sudden discharge of pus from the abdominal wound or after surgical drainage of an abscess; the patient is better because toxic absorption is reduced, but distension subsides and bowel function is restored too quickly to be explained on these grounds alone. A simple mechanical way in which the collapse of an abscess cavity can remove the obstruction is shown diagrammatically in fig. 2.

After two or three weeks, fibrinous adhesions have organised, the walls of any residual abscess have toughened, and threatened obstruction may be precipitated. It will be noted that 4 of our patients were radiographed as long as twenty to thirty days after operation because of signs of obstruction. The fact that all recovered without a further operation will astonish no-one who has evacuated an appendix abscess and removed the appendix three months later without finding any trace of adhesions.

The outcome is not always so good; some people form adhesions as readily as others dissolve them, and there is always the possibility of sudden obstruction by a single band. This accident is not difficult to diagnose, because the onset is sudden. Immediate operation is required, just as in similar obstruction unrelated to a recent operation.

## ILLUSTRATIVE CASE-RECORDS

CASE 16.—Male, aged 72. Operation: July 2, 1937, appendicectomy and drainage for perforated appendix. Distension was noticeable on the fourth day and increased progressively; less and less flatus was passed; on the seventh day he vomited, complained of considerable abdominal discomfort, with occasional colicky pains, and had audible peristalsis.

Plain radiograms: July 9; fluid levels, grade II; several distended loops of jejunum and ileum, grade III; colon not dilated. Diagnosis: typical peritonitic (infective) obstruction. Course: intravenous saline drip, no fluid by mouth, repeated ox-bile enemas. Bowels opened spontaneously after third enema; rapid clinical improvement; patient discharged to his home twenty-three days after operation.

CASE 6.—Female, aged 36. Operation: Jan. 18, 1940, total hysterectomy and left salpingo-oöphorectomy. The left ovary was densely adherent to a loop of lower ileum, which was denuded of peritoneum and patched with difficulty. The postoperative course was smooth until the fifth day, when she had colicky pain; this increased, and on the tenth day she vomited and was found to have slight distension and loud audible peristalsis.

Plain radiograms: Jan. 29, fluid levels, grade II; a few coils of small bowel of ileal type, grade II; small amount of gas in colon, up to 3·7 cm.; cæcum not distended. Diagnosis: moderate degree of obstruction in lower ileum. Food discontinued and drinks curtailed.

Jan. 30, levels, grade II; small bowel distended, grade II; colon contains more gas; diameter of cæcum 4·5 cm. Clinical condition improved steadily.

Feb. 2, no fluid levels; no definite loops of small bowel; some gas and fæces in colon; all signs of obstruction gone. Patient made an uninterrupted recovery.

There was no evidence of peritoneal infection in this case; the patient remained afebrile. The exciting cause of stasis of the small bowel was presumably reactionary œdema and fixation of the injured coil of ileum. This led to distension of the bowel and the beginning of the usual vicious circle. Curtailment of ingested fluid and food prevented further distension of the bowel, the peritonitic reaction about the injured coil at this time began to subside, and the threatened obstruction was overcome.

CASE 18.—Male, aged 58. Operation, Feb. 9, 1940, revealed a rent 1 in. long in a loop of ileum, caused by a blow on a large inguinal hernia three hours before, with soiling of the peritoneal cavity. The bowel was sutured transversely and the peritoneal cavity drained. An intravenous saline drip was set up immediately and all food and drink forbidden. Thirty-six hours later the man was much distended and vomiting.

Plain radiograms: Feb. 10, fluid levels, grade III; several jejunal and ileal coils, grade III; most of colon outlined but did not exceed 4 cm. in diameter (figs. 3 and 4). Diagnosis: typical peritonitic obstruction. Continuous stomach suction was begun. There was little change in condition.

Feb. 13, fluid levels, grade III; several loops of jejunum and ileum, grade III. Miller-Abbott tube had passed the pylorus. Considerable amount of fæces in colon, diameter 5·5 cm.; trace of gas in cæcum. As soon as the Miller-Abbott tube passed the pylorus, the man's condition began to improve.

Feb. 14. supine position only; 4 ft. of tube in the small bowel; no coils of small bowel seen; small amount of gas in cæcum and left colon. Convalescence uneventful, bowels open regularly.

## RADIOGRAMS AS INDEX TO TREATMENT

If radiography shows that the colon is distended with gas and the small bowel is not, passage of a flatus tube is the obvious procedure; if the colon is distended with

fæces, an enema will succeed. If the small bowel is distended and there are fluid levels, no food and little or no fluid should be taken. If improvement is not rapid, the stomach should be continuously aspirated through a duodenal tube or, better, a Miller-Abbott tube, which is especially useful in the severer cases, because it deflates the small bowel and so breaks the vicious circle of peritonitic obstruction.

Serial radiograms and intestinal drainage by suction are complementary. Suction effects rapid clinical improvement but does not necessarily relieve the obstruction. If plain radiograms do not give evidence of the disappearance of obstruction, a small quantity of barium emulsion should be injected into the tube; if this does not pass the obstruction it should be sucked back. If obstruction persists, reliance on the clinical condition alone may lead to dangerous procrastination.

SUMMARY

Most cases of postoperative ileus causing anxiety are due either to focal obstruction at the line of suture or, more commonly, a diffuse or peritonitic obstruction.

Plain radiograms give evidence of obstruction in both types of case.

In 5 cases of suspected focal obstruction, radiography excluded obstruction, no operation was performed and the patients recovered. In 9 cases of peritonitic obstruction, radiography demonstrated obstruction of the small intestine.

In cases of obstruction, plain radiograms taken in the erect position show distension of the small bowel with fluid levels in the distended loops.

In cases not requiring immediate operation intestinal drainage by suction through a duodenal or Miller-Abbott tube should be combined with serial radiography. Reliance on clinical signs alone may lead to dangerous delay, but radiography will show whether the obstruction is persisting.

## TREATMENT OF PNEUMONIA WITH SULPHAPYRIDINE AND SERUM

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IN a previous paper (1939) we reported the results of the treatment of a series of pneumonias due to pneumococcus type II. We concentrated at that time on type II, because the cases due to the other types were too few for analysis. It is now possible to extend the report and to include the results in infections due to pneumococci of types I, II and III, 217 cases in all. They include the 70 type-II infections previously reported, and represent a continuous series in which types I, II or III have been recovered from sputum, blood, purulent exudate or a combination of these. All have been under our supervision in Ruchill Fever Hospital, Glasgow, and since this hospital receives cases from a wide area of the city the series may be regarded as representative. The methods of study are as previously reported.

### CASES TREATED WITH SULPHAPYRIDINE

Sulphapyridine was given to 197 cases in the series, an initial dose of 2 g. being followed by 1 g. at 4-hourly intervals. Treatment usually extended over a period of 6–8 days. One of us (J. G. C.) made total and differential counts of the white blood-cells in many of the cases before and during treatment. Although most of the cases were lobar we believe in the importance of an ætiological classification and the series therefore includes a number of primary adult bronchopneumonias; indeed, in the type-III infections the atypical pneumonias predominate. Table I shows the numbers and the age- and sex-distribution. The age-distribution in the different types is not unusual and is similar to that noted by Cruickshank (1933).

*Type-I infections.*—Of the 47 cases, 6 were not treated with sulphapyridine in hospital, because they had received the drug prior to admission and recovery had begun. Blood-cultures were taken from 29 of the rest before treatment was started; 8 (27·6%) were positive. One patient developed sudden membranous obstruction of the larynx in convalescence and died after tracheotomy. There were no other deaths. The main complications were: sterile pleural effusion, 4 (8·5%); empyema, 3 (6·4%); chronic pulmonary fibrosis, 1 (2·1%).

*Type-II infections.*—Since our last publication, 42 more cases have been treated with sulphapyridine alone, making a total of 112. Blood-cultures were taken from 94 patients on their admission to hospital, 30 (32%) giving positive results. There were 14 deaths (12·5%). Seven patients died within 24 hours of admission; their average age was 57 years and the average duration of illness prior to admission 7 days. If these are excluded the fatality-rate is reduced to 6·6%. The main complications were: sterile pleural effusion, 10 (8·9%); empyema, 4 (3·6%); venous thrombosis, 1; corneal ulceration, 1; lung abscess, 1; pneumococcal meningitis, 1.

*Type-III infections.*—There were 38 cases. Blood-culture was taken on 33 patients on admission to hospital and was positive in 11 (33%). There were 11 deaths (29%). Of the 11 bacteræmic cases only 4 recovered. Three patients died within 24 hours of admission; their average age was 58 years and the average duration of the illness on admission 3·3 days. If these are removed from the series the fatality-rate becomes 23%. The following were the main complications: sterile pleural effusion, 2 (5·3%); empyema, 5 (13·1%); venous thrombosis, 1 (2·6%).

### TYPE-II INFECTIONS TREATED WITH DRUG AND SERUM

This group comprises 20 patients admitted to hospital in the first 3 or 4 days of their illness who were considered to be severely ill; they were not selected on any other grounds. They were admitted at intervals during the winter of 1939–40, and were given sulphapyridine followed by type specific antipneumococcus serum in doses which would be considered inadequate had either been given singly. After the administration of the immune serum no further specific treatment was given. A "concentrated and refined" serum (20,000 units in 3·5 c.cm.) prepared by the immunisation of rabbits was used.[1]

Horsfall and his colleagues (1937) believe that unconcentrated type-specific rabbit serum is at least as effective as concentrated horse serum in the treatment of pneumonia. It is readily produced, costs less and is easy to give. The molecule of the rabbit antibody (being smaller than that of the horse) may possibly be more diffusible.

Combined treatment was adopted for various reasons: despite the beneficial effects of sulphapyridine in type II pneumococcus pneumonia there was still an appreciable fatality-rate; sulphapyridine frequently gave rise to severe gastric discomfort with nausea and vomiting which made it necessary to stop treatment; moreover the process of resolution often seemed to be slowed down, suggesting that some stimulus to resolution had been inhibited; finally, Fleming has suggested (1938) that drug and immune serum in combination may enhance each other's action.

A general plan of treatment was followed. After a blood culture and a specimen of sputum for typing had been taken, a 2 g. dose of sulphapyridine was administered, followed by doses of 1 g. at 3–4 hourly intervals so that an average total of 6–7 g. (maximum 10 g., minimum 4 g.) was given within 12–16 hours of admission. During this time the patient's sensitivity to rabbit serum was tested by the instillation of a few drops into the conjunctival sac. The pneumococci in the sputum were typed. The patient was then given an initial dose of 20,000 units of rabbit serum intravenously, followed 2–4 hours later by the main dose of serum, usually from 40,000 to 60,000 units. In a few cases a third dose (40,000 units) was given 6 hours later, the average total dose being 70,000 units (maximum 120,000, minimum 40,000). No further treatment was given.

Clinically the immediate results were striking; there was invariably a sudden and rapid improvement within 12 hours after the first administration of serum; not merely was the temperature subnormal but the patient looked and felt exceedingly well. In other words the illness terminated in a manner more akin to the normal

1. Kindly supplied by Messrs. Lederle, New York.

crisis than usually happens after sulphapyridine alone. That the group of patients was a fair sample of the type-II cases is suggested by the fact that bacteræmia was present in 7 (35%) on admission to hospital. There was 1 death, due to the development of a purulent pneumococcal pericarditis. The other complications were: sterile pleural effusion, 2 (10%); empyema, 1 (5%).

TABLE I—AGE- AND SEX-DISTRIBUTION IN WHOLE SERIES
(DEATHS IN PARENTHESES)

| Age | TYPE I | | TYPE II Drug only | | TYPE II Drug + serum | | TYPE III | |
|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. |
| Up to 19 .. | 7 | 2 | 16 | 6 | 2 | 1 | 2 | 1 |
| 20–29 .. | 12 | 7 (1) | 20 (1) | 7 | 4 (1) | 3 | 2 (1) | 1 |
| 30–39 .. | 6 | 0 | 14 (1) | 3 | 2 | 0 | 0 | 1 |
| 40–49 .. | 3 | 0 | 12 (1) | 10 (4) | 4 | 2 | 5 (1) | 3 |
| 50–59 .. | 7 | 2 | 8 (2) | 7 | 0 | 2 | 13 (5) | 6 (1) |
| 60–69 .. | 1 | 0 | 2 | 4 (2) | 0 | 0 | 2 (2) | 2 (1) |
| 70 and over | 0 | 0 | 3 (3) | 0 | 0 | 0 | 0 | 0 |

M. = male. F. = female.

Although toxic effects attributable to sulphapyridine were absent, there was a high incidence of delayed serum-sickness, 8 (40%) of the cases showing a reaction. This agrees with the experience of others who have used rabbit serum. Horsfall and his colleagues report that 12 out of 22 patients showed late reactions, while Brown and Finland (1939) reported late reactions in 5 out of 9 patients. With horse antiserum in the treatment of pneumonia similar high rates have been reported, although, of course, a much larger bulk of horse serum is usually administered. In our series the reactions were alarming in two cases and included pyrexia, rash, arthralgia, œdema of the face and general malaise for 7 days in one case and 11 in the other. In the other cases the duration was 2–4 days. Arthralgia and rash were noted most commonly; in one case myalgia with fibrositis was severe, while in another the only abnormality was general enlargement of lymphatic glands. The time of onset after administration of the serum was early in 2 cases (4 days) but in the remainder was 9–11 days. There was no obvious relation between the amount of serum given and the incidence of serum-sickness; only one received 100,000 units, while in the remainder the dose was 60,000 units. In none was there any immediate reaction to the intravenous injection.

## DISCUSSION

Sulphapyridine therapy does not alter the fact that the fatality-rate in pneumonia varies from type to type. In treated cases, type III still remains the most fatal, then type II; type I, in the present series, gave rise to no deaths. Gaisford (1939) has suggested that the sterile pleural effusions so frequently encountered represent the empyemata which drug treatment has prevented. We do not agree with such a simple explanation. One of us had considerable experience of typed pneumococcal pneumonias between 1931 and 1934. At this time there were twice as many empyemata due to type I pneumococcus as there were to type II. A similar predominance of type I pneumococcus as a cause of empyema has been noted by Cruickshank (1933). Table II shows that although the incidence of empyema in type-I infections is still appreciably higher than in type-II, sterile pleural effusions occur with equal frequency in the two types. This suggests that the occurrence of a sterile effusion is unrelated to the type of infecting organism.

TABLE II—RESULTS IN WHOLE SERIES

| — | TYPE I Drug only | TYPE II Drug only | TYPE III Drug only | TYPE II Drug+ immune serum |
|---|---|---|---|---|
| Number of cases .. .. | 47 | 112 | 38 | 20 |
| Fatality-rate % .. .. | 0 | 12·5 | 29 | 5 |
| Fatality-rate % (excluding cases dying within 24 hrs.) | 0 | 6·6 | 23 | 5 |
| Fatality-rate % (bacteræmic cases) .. .. .. | 0 | 23·3 | 63·6 | 14·3 |
| Sterile pleural effusion rate % .. .. .. .. | 8·5 | 8·9 | 5·3 | 10 |
| Empyema rate % .. .. | 6·4 | 3·6 | 13·1 | 5 |

Bacteræmia has a serious prognostic significance. Bullowa and Wilcox (1935) state that the fatality-rate in bacteræmic cases is at least double that in non-bacteræmic cases due to the same type. Our figures indicate that this holds true despite drug treatment. The cases which received combined drug and serum therapy are too few for strict analysis but the immediate clinical result was gratifying. It might however be said in criticism that most of them would have recovered with greater amounts of sulphapyridine without the addition of serum and the discomfort of serum-sickness. The results are not however inferior to those obtained with much larger doses of the drug alone and we consider combined treatment worthy of further trial. Its immediate crisis-like benefit must be balanced against intolerance of the larger doses of sulphapyridine on the one hand and serum-sickness on the other.

The results of drug treatment in the type-III infections are disappointing, although the group has been somewhat unfortunate in that the occurrence of five empyemata in such a small sample is unusual. Only one lived long enough to permit of operation. If the high fatality-rate occurring in our type-III infections is to be regarded as a normal experience, reliance on sulphapyridine alone is unjustifiable and the findings suggest that the combination of specific type-III serum and drug merits consideration. Age remains an important factor in the prognosis of pneumonia, despite drug treatment. In the type-II infections the fatality-rate under 40 years was 3·8%; over 40 years it was 22·2%. In the type-III cases the figures were 14·3% and 32·2%. The high fatality-rate over 40 years is disquieting and suggests that reliance on sulphapyridine alone is unwise. The combination of serum and drug should be investigated further, especially in this age-group and when bacteræmia is present.

TABLE III—FATALITY-RATE IN SULPHAPYRIDINE SERIES COMPARED WITH THAT OF CASES TREATED BEFORE THE INTRODUCTION OF CHEMOTHERAPY

| Period | TYPE I | | TYPE II | | TYPE III | |
|---|---|---|---|---|---|---|
| | Total | Fatality-rate % | Total | Fatality-rate % | Total | Fatality-rate % |
| 1931–34 | 215 | 8·4 | 216 | 28·2 | 31 | 22·6 |
| 1938–40 | 47 | 2·1* | 132 | 11·4 | 38 | 29·0 |

* The single fatality in type I (from laryngeal obstruction) is included for statistical purposes.

A considerable delay in the resolution of the consolidated lung continues to be observed in patients treated with sulphapyridine. The drug seems to prolong the period of resolution. In many cases the chest has remained stony-dull to percussion for two or three weeks after the temperature has fallen. The physical signs are often suggestive of fluid but paracentesis yields negative results. At present the reason for this delay remains obscure. Between 1931 and 1934 a series of cases was treated by one of us in the same hospital on non-specific lines, and a comparison of the results of the two methods of treatment (table III) demonstrates that a great saving of life has followed the use of sulphapyridine. But there is still much room for improvement, especially in type-III infections.

## SUMMARY

1. Of 217 cases of infection due to pneumococci types I, II and III, 197 were treated with sulphapyridine alone and 20 with sulphapyridine and serum.

2. Of 47 cases of type-I infection treated with sulphapyridine there was 1 death; of 112 cases of type-II infection, similarly treated, 14 died; of 38 cases of type-III infection, 11 died. Resolution seems to be prolonged by the use of sulphapyridine.

3. In all the patients treated with combined drug and serum, there was striking clinical improvement within 12 hours, but 1 died later of pericarditis. No toxic effects due to sulphapyridine were seen, but 8 patients showed delayed serum-sickness.

4. The relative virulence of the various types was not disturbed by sulphapyridine therapy: type III remained the most, and type I the least, fatal.

5. The age of the patients affects prognosis. In type-II infections the death-rate was 3·8% in patients under 40 and 22·2% in patients over 40; in type-III infections the corresponding rates were 14·3% and 32·2%.

6. The death-rate in bacteræmic cases was at least double that in non-bacteræmic cases due to the same type.

We wish to thank Dr. W. M. Elliott for permission to carry out the investigation; Messrs. C. F. Thackray for supplies of rabbit serum; Mr. T. B. Gallie for technical assistance; and Sisters Grant and McFiggins for their coöperation.

REFERENCES

Anderson, T., Cooper, E. D., Cairns, J. G. and Brown, D. R. (1939) *Lancet*, **2**, 776.
Brown, J. W. and Finland, M. (1939) *Amer. J. med. Sci.* **197**, 369.
Bullowa, J. G. M. and Wilcox, C. (1935) *Arch. intern. Med.* **55**, 558.
Cruickshank, R. (1933) *Lancet*, **1**, 563, 621 and 680.
Fleming, A. (1938) *Ibid.* **2**, 74.
Gaisford, W. F. (1939) *Proc. R. Soc. Med.* **32**, 1070.
Horsfall, F. L., Jr., Goodner, K., MacLeod, C. M. and Harris, A. H., Jr. (1937) *J. Amer. med. Ass.* **108**, 1483.

# SULPHATHIAZOLE IN TREATMENT OF PNEUMOCOCCAL LOBAR PNEUMONIA

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MOST of the more important information now available concerning 2 (para-aminobenzenesulphonamido) thiazole, generally known as sulphathiazole and also in this country as M. & B. 760 and Thiazamide, has been summarised in leading articles in the *Lancet* (May 11, 1940) and the *British Medical Journal* (June 22, 1940). The majority of the clinical reports have described studies of the usefulness of the drug in the treatment of staphylococcal infections and the only published clinical trials in pneumococcal infections are those of Gsell (1940), and of Flippin et al. (1940) who treated 100 cases of pneumococcal pneumonia of different types with a 12% mortality.

It was decided to employ sulphathiazole in a series of pneumococcal lobar pneumonias at Dudley Road Hospital and to use alternate patients treated with sulphapyridine as controls. Children were not included since they tolerate sulphapyridine so well that it seemed unnecessary.

The first case to receive the drug was admitted on April 3, but the admissions of cases of lobar pneumonia to hospital this spring and summer have been the fewest on record, and this has been the experience we understand at other large hospitals in Great Britain. Any hope of our being able to produce an adequate number to be of statistical value was soon found to be out of the question, and this report refers to only nineteen cases.

We adopted a similar method of investigation to that employed in our original study of sulphapyridine (Evans and Gaisford 1938)—namely, strict clinical criteria of diagnosis, X-ray examination, sputum typing and daily blood-counts. In addition, the assistance of a whole-time technician allowed us to make full biochemical investigations, frequent blood-level determinations (on an average 10 in each patient during the 48 hours of treatment and the subsequent 24 hours), daily red-cell counts, hæmoglobin estimations, as well as differential blood-counts being made. Every possible specimen of urine was examined for sulphathiazole content, albumin, casts and cells, and on an average 12 specimens of urine were examined chemically and microscopically for each patient. Fractional test-meals were also carried out in a number of the control cases receiving sulphapyridine to see if the vomiting was in any way related to the amount of hydrochloric acid present in the stomach, or whether this level was affected by the drug, but the results obtained were inconclusive.

The dosage employed was similar to that with sulphapyridine—namely, 2 g. (4 tablets) on admission and repeated 4-hourly for three doses and then 1 g. (2 tablets) 4-hourly for 24 to 36 hours, as necessary, ending the course with 1 tablet three times or twice during the final 24 hours after the temperature had fallen to normal. One patient was given an initial intravenous dose of a solution of the sodium salt containing 1 g. of sulphathiazole in 20 c.cm. of normal saline, followed by a similar one after 4 hours, treatment being then continued by mouth. The average total dosage was 14·5 g. Intramuscular injection was not used in any case.

## RESULTS

It was only because we found no evidence that sulphathiazole was superior or equal to sulphapyridine in the treatment of pneumococcal lobar pneumonia that it was thought worth while placing on record this preliminary note, for there were but ten cases of true lobar pneumonia treated with sulphathiazole during the investigation. Two other cases were also investigated, but radiography revealed no evidence of consolidation. There were no deaths and only one patient had any complication—a man of 55 with a type II pneumonia who developed an empyema which was subsequently drained and a good recovery resulted. During the same period there were no deaths among the nine sulphapyridine cases and only one with a complication—a sterile serous effusion. Pneumococci were isolated from five of the cases receiving sulphathiazole, three being type II, one type III and one type IV.

TYPICAL RESULTS OF BLOOD EXAMINATIONS ON A SINGLE CASE TREATED WITH SULPHATHIAZOLE

| Day of disease .. | 2nd | 3rd | 4th | 5th |
|---|---|---|---|---|
| Red cells per c.mm. in millions .. | 5,080 | 5,380 | 5,460 | 4,780 |
| Hæmoglobin % (Sahli) .. | 102 | 103 | 106 | 100 |
| Colour-index .. .. | 1·0 | 0·97 | 1·0 | 1·0 |
| White cells per c.mm. .. | 35,200 | 31,800 | 17,100 | 11,100 |
| Polymorphonuclears % .. | 84 | 88 | 85 | 68 |
| Lymphocytes (small) % .. | 8 | 5 | 10 | 19 |
| ,, (large) % .. | 0 | 3 | — | 1 |
| Hyalines % .. .. | 0 | 4 | 2 | 8 |
| Eosinophils % .. .. | 0 | 0 | 0 | 3 |
| Basophils .. .. | 0 | 0 | 0 | 0 |
| Myelocytes % .. .. | 1 | 0 | 1 | 0 |
| Metamyelocytes % .. | 7 | 0 | 2 | 1 |

*Fall in temperature.*—The rapid fall in temperature seen with sulphapyridine was not so striking in the cases treated with sulphathiazole, and in nearly all of these there was a 12-hour lag, so that the average time between the beginning of treatment and the fall in temperature was 36–48 hours. Characteristic temperature charts of cases treated with the two drugs are shown in figs. 1 and 2.

*Nausea and vomiting.*—Only one patient who received sulphathiazole vomited and none complained of nausea. It was by no means certain in the patient who did vomit that this was due to the drug since he had done so repeatedly before admission. One nurse, not included in this series, who had severe nausea and vomiting when treated with sulphapyridine last year showed no signs of intolerance to a course of sulphathiazole in May, 1940.

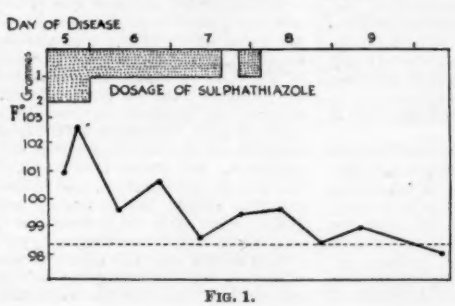


FIG. 1.

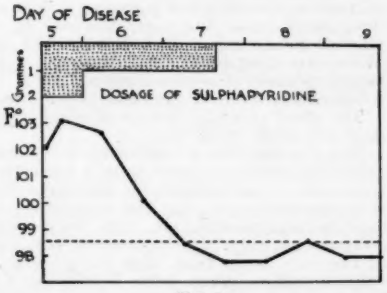


FIG. 2.

*Blood-counts.*—In none of the cases treated with sulphathiazole was there any significant alteration in the blood-count as the result of the treatment. The number of red cells and the hæmoglobin percentage remained almost constant in each case and no differential count showed any tendency to granulopenia, as may be seen in the table, which is representative of our findings.

*Blood levels.*—Fig. 3 shows graphically the maximum and minimum blood concentrations of free and total sulphathiazole obtained in two cases (A and B) with details of the oral administration of the drug. The curves for the remaining patients lay between these two with one exception where there was a delay in the rise of the blood level for 18 hours, but this patient eventually attained a concentration of 14·2 mg. per 100 c.cm. of total and 13·5 mg. per 100 c.cm. of free sulphathiazole and maintained high concentrations for some time after the dosage had been reduced. This retention of the drug was probably due to renal dysfunction, albumin and casts being present in all specimens of urine examined both before and after treatment. There is insufficient evidence to enable us to suggest an optimal blood concentration, since excellent clinical results have been obtained when the blood contained as little as 3 mg. per 100 c.cm. of the unchanged drug and poor results have been noted with much higher levels.

*Action on urinary system.*—Experimental work in animals has suggested that renal damage might occur after sulphathiazole, and cases of hæmaturia, anuria and concretions in the tubules have been reported clinically in America and this country. These findings are not

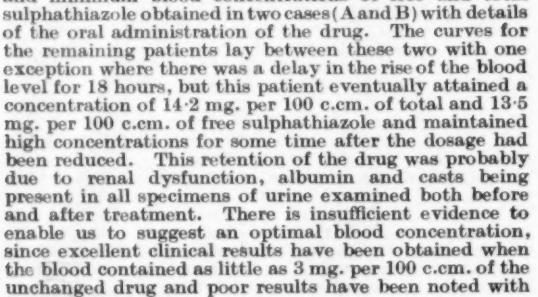


FIG. 3.

surprising in view of the fact that the acetyl derivative of sulphathiazole is even less soluble than that of sulphapyridine; but in our cases, apart from transient albuminuria seen before treatment was begun and representing a not unusual febrile phenomenon, there was no evidence of any renal damage and no red cells or casts were seen.

### CONCLUSIONS

This preliminary trial of sulphathiazole in ten cases of pneumococcal lobar pneumonia has shown that the drug is of value and acts similarly to sulphapyridine, though producing a less prompt fall in temperature. With this temperature lag there is a correspondingly longer period of acute illness. This renders sulphapyridine the drug of choice in severe cases.

The chief point in favour of sulphathiazole is that it does not cause vomiting.

It is possible that a combination of sulphapyridine and sulphathiazole may come to be a valuable routine in the treatment of pneumonia, the first large doses given being sulphapyridine (e.g., the first 8 tablets) and the following ones sulphathiazole. In this way vomiting can be obviated entirely. An alternative is the use of a mixture of the two drugs from the outset—e.g., 2 tablets of sulphapyridine given with 2 tablets of sulphathiazole four-hourly for the first three doses, and then 1 tablet of each. The first method has already been used since these investigations were undertaken with very satisfactory results.

We are indebted to Dr. T. M. Anderson, medical superintendent of the hospital, for permission to publish these cases; to Messrs. May and Baker for supplies of sulphathiazole; and to Mr. W. A. Freeman who carried out the biochemical investigations.

### REFERENCES

Evans, G. M. and Gaisford, W. F. (1938) *Lancet*, **2**, 14.
Flippin, H. F., Schwartz, L. and Rose, S. B. (1940) *J. Amer. med. Ass.* July 20th, p. 248.
Gsell, O. (1940) *Schweiz. med. Wschr.* **70**, 342.

## TOXIC MANIFESTATIONS OF CALCIUM THERAPY IN HEART FAILURE

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WITHIN recent years intravenous administration of calcium gluconate has been employed in the treatment of cardiac failure. Although at times beneficial this procedure is not entirely without risk.

In animals large intravenous injections of calcium salts lead to a very rapid reduction of blood-pressure, inhibition of the cardiac and respiratory movements and arrest of urinary secretion. Smaller injections produce changes in the tonus of skeletal muscles. In man an intravenous injection of 4 c.cm. of a 10% solution of calcium chloride has produced dizziness, collapse, respiratory embarrassment and generalised muscle spasm; recovery ensued in five minutes (Lloyd 1928). The rate of injection was not reported but in view of later findings it is almost certain that the solution was given too rapidly. Liebermann (1933) states that while very large amounts of calcium can be given if the rate of administration is sufficiently slow even small doses may prove fatal when given quickly. McGuigan and Higgins (1938) stress the importance of this and suggest that the administration of 10 c.cm. of a 10% solution of calcium gluconate should take at least two minutes. When this rate is not exceeded there is little discomfort. The first sensation to be experienced by the patient is a feeling of heat in the mouth, sometimes associated with a metallic taste. A sense of heat is complained of at the site of injection; this rapidly spreads over the surface of the body. In some cases there has been slight flushing of the cheeks and in others a slight and transient increase in the respiratory rate. In all over 100 patients have been given injections of 10% calcium gluconate. There were no febrile reactions and only 2 developed any serious symptoms and in both this was due to digitalisation.

### CALCIUM AND DIGITALIS

It is obvious that if calcium is to be used clinically careful consideration must be given to the possibility of toxic effects arising from its combination with digitalis. The work done on the pharmacology of calcium has demonstrated a close similarity between its action and that of digitalis.

Loewi (1918) stressed the close relationship between the actions of the two drugs on the heart and even suggested that the main effect of the digitalis glucosides was obtained by sensitising the heart muscle to calcium. Cheinisse (1922) was of the opinion that calcium enhanced the action of digitalis in patients with cardiac œdema. Our own results with œdematous patients appear to support this hypothesis. According to Billigheimer (1924) the actions of calcium and digitalis are similar except that those of the former are more transient. He found that no ill effects resulted from using the two in combination, and indeed he recommended this in order to obtain the combined action. Gold and Edwards (1927) were able to reduce the minimum lethal dose of ouabain in dogs by producing hypercalcæmia. Mandelstamm (1926) found that the effect of strophanthin in rabbits was enhanced by increasing the calcium content of the cardiac muscle but that the glucoside did not sensitise the heart to

calcium. Nahum and Hoff (1937) obtained no increase in the calcium effect on the rabbit heart after large doses of digitalis. On the other hand Fischer (1928) and Nyiri and Dubois (1930) in frogs found that digitalis increased the action of calcium on the heart. Golden and Brams (1938) working with dogs obtained a lower M.L.D. of calcium after the intravenous administration of one of the digitalis glucosides and La Barre and Van Heerswynghels (1939) reported that digitalisation of cats rendered them much more susceptible to the action of calcium.

It seems wise, therefore, to be cautious when calcium is being given intravenously to a patient whose tissues contain a considerable amount of digitalis glucosides. The administration of digitalis by mouth to a subject with hypercalcæmia is not, however, likely to be dangerous since the digitalis is relatively slow in affecting the heart.

Bower and Mengle (1936) were the first to state definitely that it is dangerous to use calcium and digitalis simultaneously. An unfortunate experience in two cases led them to this conclusion. Both patients were fully digitalised when they received intravenous injections of calcium salts and both died within a few minutes. The problem was then investigated in dogs and it was found that although previous digitalisation reduced the M.L.D. of calcium previous administration of calcium had no effect on the M.L.D. of digitalis.

### ILLUSTRATIVE CASES

In the past three years the effect of calcium therapy has been investigated in 110 patients, of whom 2 developed symptoms of poisoning which are probably to be attributed to a combined calcium-digitalis effect.

CASE 1.—A woman, aged 30, was admitted to Stobhill Hospital on Feb. 8, 1938 with severe dyspnœa, cyanosis and extensive œdema and auricular fibrillation. There was a history of cardiac trouble dating from an attack of acute rheumatism in childhood. She was given rest, appropriate diet, digitalis and Mersalyl. Improvement was noted, but some cyanosis still remained and the œdema was not much reduced. The heart remained irregular. After 23 days on digitalis (pulv. digitalis gr. 6 daily) she was given a daily intravenous injection of 10 c.cm. of 10% calcium gluconate, while digitalis therapy was continued. On March 7, after the fourth injection of calcium gluconate, the heart slowed considerably and coupling of beats was noted. Calcium and digitalis were then stopped. On the 10th digitalis was resumed but was stopped again on the 16th owing to the appearance of numerous extrasystoles verified by electrocardiograph tracings. On the 19th digitalis was again given for two days, but again had to be stopped because of a fall in pulse-rate and the reappearance of extrasystoles. On the 22nd, 23rd and 24th 10 c.cm. of 10% calcium gluconate was given intravenously once daily. Half an hour after the third injection the patient had a severe rigor lasting for three-quarters of an hour and she vomited and became very cyanosed. The heart-rate jumped from 44 to 132 per minute. The cyanosis and tachycardia persisted until the patient died twelve hours later. Permission for post-mortem examination was not granted.

It is difficult to be certain that the patient would not have died without calcium therapy, but the events were sufficiently dramatic to make one sensible of the danger of administering calcium intravenously to anyone receiving digitalis.

CASE 2.—A man, aged 52, had had his right leg amputated in 1937 because of arterial embolism and gangrene. He was admitted to Stobhill Hospital on April 4, 1938, suffering from embolism of the left femoral artery. Expectant treatment was adopted and eventually the big toe and the distal part of the second toe developed dry gangrene. The condition was complicated by severe cardiosclerosis; the heart sounds were almost inaudible, the blood-pressure was 105/80, and the lips were cyanosed. The cardiac rhythm was regular. After the acute conditions had subsided and the gangrene had developed, œdema appeared in the foot, ankle and to a slight extent in the leg up to the knee. Pulv. digitalis gr. 1 t.i.d. was given from May 2 till June 3, but the œdema was unchanged. Accordingly, 10 c.cm. of 10% calcium gluconate was given on June 3, 4, 6, 7 and 8. The œdema persisted and since there was no improvement in the general condition the injections of calcium gluconate were stopped; the digitalis was, however, continued. On the afternoon of June 9 the patient vomited and the heart-rate fell by 20 beats per minute. Next day there was striking clinical improvement and three days later the œdema had completely disappeared.

In this case digitalis had been given for 32 days before the administration of calcium without evidence of response. Calcium seems to have increased the sensitivity of the patient to the drug and led to the production of toxic symptoms.

These two experiences decided us to make it a rule not to give an intravenous injection of calcium gluconate until at least four days after the last dose of digitalis. In this interval if a patient has been receiving full doses of the drug and is completely saturated the amount of digitalis in the tissues will be reduced by the excretion of gr. 8–9—i.e., by about 35%. Since this procedure was followed no toxic effects have been observed, although many patients with varying degrees of heart failure have received intravenous injections of calcium gluconate.


### SUMMARY

The intravenous injection of 10 c.cm. of 10% calcium gluconate does not lead to toxic manifestations provided at least two minutes are allowed for the administration.

Literature is summarised indicating the additive effects of digitalis and calcium on the heart.

Two cases are described showing the danger of giving calcium gluconate intravenously to digitalised patients. It is recommended that when patients are receiving digitalis this drug should be stopped for four days before calcium is administered.


I should like to express my thanks to Prof. Noah Morris and to Dr. W. Martin for their help and to the Medical Research Council for a grant towards expenses.

### REFERENCES


Billigheimer, E. (1924) *Z. klin. Med.* **100**, 411.
Bower, J. O. and Mengle, H. A. K. (1936) *J. Amer. med. Ass.* **106**, 1151.
Cheinisse, L. (1922) *Pr. méd.* **30**, 81.
Fischer, H. (1928) *Arch. exp. Path. Pharmak.* **130**, 194.
Gold, H. and Edwards, D. J. (1927) *Amer. Heart J.* **3**, 45.
Golden, J. S. and Brams, W. A. (1938) *Ann. intern. Med.* **11**, 1084.
La Barre, J. and van Heerswynghels, J. (1939) *Arch. int. Pharmacodyn.* **61**, 233.
Liebermann, A. L. (1933) *J. Pharmacol.* **47**, 183.
Lloyd, W. D. M. (1928) *Brit. med. J.* **1**, 662.
Loewi, O. (1918) *Arch. exp. Path. Pharmak.* **82**, 141.
Mandelstamm, M. (1926). *Z. ges. exp. Med.* **51**, 633.
McGuigan, R. A. and Higgins, J. A. (1938) *J. Lab. clin. Med.* **23**, 839.
Nahum, L. H. and Hoff, H. E. (1937) *Proc. Soc. exp. Biol. Med., N.Y.* **36**, 860.
Nyiri, W. and Dubois, L. (1930) *J. Pharmacol.* **39**, 111.


## Reviews of Books

### Diseases Affecting the Vulva

By ELIZABETH HUNT, M.D. Lpool, hon. physician to the skin department of the South London Hospital for Women. London: Henry Kimpton. Pp. 215. 21*s*.

THIS book is written by a dermatologist for gynæcologists and general practitioners who are called on to treat the numerous affections of the vulva. When one recalls the empirical and haphazard way in which most vulval affections are dismissed in outpatient departments with a douche or calamine lotion it is clear that Dr. Hunt is tackling a genuine problem in this concise and readable book well fortified with illustrations. The histopathology of each lesion is carefully examined and there are many microphotographs, all of which are understandable even to the inexpert histologist. Treatment follows sound conservative lines, but it is up to date and based on scientific principles. Each chapter is a self-contained unit, and though the book is a small one it completely covers every rare and common skin lesion found in the region of the vulva.

### Diseases of Infancy and Childhood

(3rd ed.) By WILFRID SHELDON, M.D. Lond., F.R.C.P. London: J. and A. Churchill. Pp. 756. 24*s*.

Dr. Sheldon's teaching is based on practice, but he has included accounts of rare conditions without making the volume unwieldly. This edition has been thoroughly revised and a few omissions have been repaired. As in all recent books on medicine there are many new

references to sulphanilamide and sulphapyridine, but Dr. Sheldon has taken a critical attitude to these drugs, and does not look upon them as a panacea. The appendix on their administration is useful but gives scanty information about intramuscular and intravenous injection. Another new appendix is a useful guide to the myriad of vitamin preparations.

### Annual Review of Biochemistry

Vol. IX. Edited by J. M. LUCK and J. H. C. SMITH, Stanford University, California. California: Annual Reviews Inc. Pp. 744. 27*s.* 6*d.*

THE publication of the Annual Review of Physiology has had the effect of confining the reviews in this volume more strictly to biochemistry, which lessens the appeal of the book to the general medical reader, an appeal which in any case was slight since few general readers could be expected to plunge into the midstream of current biochemical progress. To the biochemist the volume is most useful, but it would be an advantage if the authors would arrange their references in a standard form. At present some bibliographies are given in alphabetical order and others in the order in which references appear in the text, which is less satisfactory. The form of the book deserves consideration; specialist workers are unlikely to be interested in more than a few of the many articles, and few research workers in this country can afford the purchase price for the sake of one or two articles. The *Revue annuelle de physiologie* set an example by publishing its reviews separately and cheaply in paper bindings. The complete bound volume could still be available for libraries and anyone else who wanted it. An enterprise in scientific publishing on these lines might meet with a surprisingly large response. The preface to the book, written in California in the early days of April, deplores the fact that it is almost impossible to write calmly and with a sense of detachment. Prof. Samson Wright has already remarked that while English scientists are getting used to the cold water the Americans are still standing on the edge shivering. Apart from this aspect, the war has had more serious repercussions in that for the first time there are no contributions from Germany. Have biochemists in that country ceased to do work of international importance? If not it is surely up to America to make their findings known. A review on muscle by Prof. Parnas of Lwow which should have appeared was not received. There are, in fact, only ten contributions from outside America—six from Britain and four from Scandinavia.

### Hæmophilia and Egg-White Derivatives

*Coagulant, Anti-Coagulant and Bactericidal Effects.* By W. A. TIMPERLEY, M.B., M.Sc. Sheff. Leeds: Printed for the author by Jowett and Sowry. Pp. 63.

SINCE Dr. Timperley published with Professors A. E. Naish and G. A. Clark (*Lancet*, 1936, 2, 1142) his claim to reduce the clotting-time of blood with derivatives of egg-white other workers in this country and in America have tried without success to reproduce his results. On the other hand Dam's researches on the coagulating defect in jaundice have not only been confirmed, but have been widened in application and have led to the synthesis of pure vitamin K. In this little monograph Dr. Timperley summarises his researches. Hæmophilia is a long and crippling disease, in which the patient may well acquire faith in a physician who treats him with enthusiasm and inspires him with hope, but this record of crises overridden will leave most readers unpersuaded that the treatment has specific value.

### Anatomy of the Female Pelvis

(3rd ed.) By F. A. MAGUIRE, M.D. Sydney, F.R.C.S., F.R.C.O.G. London: Angus and Robertson. Pp. 162. 10*s.* 6*d.*

THE good name of this little book is simply explained. It is written by a surgeon and an anatomist who uses first principles, simple language and exceptionally well-drawn diagrams to unravel the pons asinorum of all students starting the study of gynæcology and obstetrics. The book is based on the dissection and serial section of 16 female pelves. It should be kept by the teacher for reference, and should be read by all students about to embark on their six months' gynæcological and obstetric clerkship. It could also be used with profit by the second-year student dissecting the female pelvis. If before making his first vaginal examination the student reads the last chapter on physical examination he will find himself missing very little clinical detail. Those facing their final examination should spend a quiet half hour rereading the chapters on the pelvic muscles and fascia, the pelvic connective tissue and the supports of the uterus.

### Forensic Chemistry

By HENRY T. F. RHODES, Dip. Inst. C. (Lyon), hon. research assistant, Conan Doyle Laboratory of Chemical Research, Technical Police, Prefecture of the Rhône, France. London: Chapman and Hall. Pp. 214. 12*s.* 6*d.*

IN this elementary little book the author has collected the details of forensic analysis in a manner that is not without attractions, although to a limited public owing to the author's particular interests in the detection of crime. Fully three-quarters of the book is taken up with the identification of prints, dusts, metals, ashes, stains, firearm powders, questioned documents and counterfeit money, the remainder dealing with the analysis for poisons. In the former Rhodes shows an unusual grip of the subject which enables him to present it lucidly. Extensive indexes, both subject and author, add value to what is a pleasing and helpful laboratory detective handbook.

### Histological Technic

*Including a Discussion of Botanical Microtechnic.* By ABRAM A. KRAJIAN, department of pathology, Los Angeles County Hospital. London: Henry Kimpton. Pp. 272. 18*s.*

THE methods described in this book cover the investigation of normal and pathological material, with the exception of the pituitary and pineal glands. The author gives a detailed exposition of the preparation and staining of frozen sections; preparations of the kind can be quickly and inexpensively made and those who wish to use them will find many helpful suggestions here. Modifications of known methods suggested by the author invite trial, since he is clearly an enthusiastic technician. The reproduction of the microphotographs is good except for those in colour, which probably do insufficient justice to the original preparations. An unusual feature is the 28-page section on botanical methods by Dr. E. D. Woodhouse; this may be helpful to pathologists who wish to extend their observations to the plant kingdom.

### Elementary Pathological Histology

(2nd ed.) By W. G. BARNARD. London: H. K. Lewis and Co. Pp. 70. 10*s.*

THE war-time student who does not find his instruction too easy to come by should cordially welcome the second edition of Prof. Barnard's book. First published in 1928, the book was originally intended for use on the bench when sections were being examined, and the author has been content that it should so remain—a description of the common things of morbid histology without theories and without padding. Each chapter consists of a short description of the pathological process under review, together with a series of excellent black and white photomicrographs. Prof. Barnard urges the student not to be content with looking down a microscope and "spotting" what a section is, but to try and resolve the section into the various cells and particles and substances of which it is compounded. As he says, there is nothing inherently indelicate in a curiosity which brings an oil-immersion lens to bear on a tumour or an inflammation. It is only by minute examination that we can expect to be in a position to explain the series of events which have taken place and to assess the effect of the changes of function. The book is essentially concerned with the general principles of morbid histology, such as infection, inflammation, regeneration, necrosis, and so on. Regional pathology therefore takes its place as a study of the general morbid process applied to a particular organ. The student who expects to have his knowledge potted and labelled ready for him to assimilate will find the time and trouble spent on these general principles well repaid. Prof. Barnard is a wise guide who does not confound knowledge with words. The illustrations, especially the colour plates, deserve high praise.

# THE LANCET

*LONDON: SATURDAY, OCTOBER 12, 1940*


## DOCTORS IN NEED

WE are only at the end of the first year of the war and there is already economic distress among members of our profession which needs instant attention. It was at about the same period in the last war that an appeal was made which took a rather different form. The appeal was then rather to those who remained in civil practice to take a sort of monastic vow not to live more luxuriously than those who went to the front. There is little need now to curb luxury, for in common with other citizens we are rationed for our essentials and have no time for accessories, and the situation is profoundly altered by the fact that the battle front now covers the whole country. The extent of financial distress can as yet hardly be estimated. We know that a few practitioners in London have been killed at their work and our obituary columns contain week by week the names of some who have been cut off at the outset of their career. Whatever the needs of their dependants it is for the profession as a whole to make sure that there is no distress. Others of our members have lost property, while some have been evacuated at short notice from the towns where they normally practise. Numerically the need cannot be overwhelming, and in time the unemployment resulting from the movement of population should adjust itself. Many retired men have in fact come back into practice. While, therefore, in the majority of cases nothing more may be needed than some assistance in the form of a loan repayable on very easy terms when the recipient has been able to re-establish himself there must be others where a young practitioner has been cut off before he had time to make provision for the future; in such cases the education of his children should be a charge on his professional colleagues. Our profession has always responded generously to special appeals, though it has been less sensitive to the prolonged need made evident in the work of the R.M.B.F. That body has undertaken to distribute the monies received in the light of long experience in helpful and tactful work. We publish on another page a complete list of subscriptions to the relief fund up to Monday last totalling some £4400 and we commend the fund to the hearts and pockets of our readers according to their capacity.

## INFECTION IN THE SHELTER

THE Government is at last tackling the public-health aspects of air-raid shelters seriously. A committee with Lord HORDER as chairman has made its recommendations with commendable promptitude after a four-day (and night) tour of the London shelters, and these are to be implemented by an interdepartmental committee of the Ministries of Health and Home Security. Admiral Sir EDWARD EVANS has been appointed to give his full time to shelter administration, and the Horder committee remains in session. This is good news, for many shelters—tube stations, basement, Anderson, surface or underground—hold the ingredients necessary for the epidemic spread of infection. The communal shelters were originally intended for the protection of people caught in the streets by daylight raids, but with the night bombing of London a new problem arose. The surface shelters became unpopular and there was a wholesale flocking to the deep shelters and the tubes, which could offer freedom from noise, fellowship, light and (sometimes) room to lie down. The shelter became a dormitory instead of a temporary refuge. To the most popular people came from long distances, bringing their bedding, and friends found places for old people, the bedridden and infirm while the queues waited outside. Gross overcrowding has resulted, and the lack of sanitation and sanitary supervision, of heating and ventilation, coupled with lack of sleep, nervous strain and improvised meals, has brought the danger of typhoid and dysentery, and, more menacing still, the respiratory infections.

The first essentials are some regulation of those who use the public shelters at night, proper sanitary arrangements, bunks to sleep in, heating, and health supervision of the regular habitués. Many people use the communal shelters when they could provide themselves with adequate protection at home. A reissue of the excellent pamphlet "Your Home as an Air-raid Shelter," incorporating fresh ideas like using the dining-room table as a house-kennel, supplemented perhaps by visits from the A.R.P. staff to give advice and guidance, would encourage many folks to sleep in the comparative peace and comfort of their own warm, dry homes. The dispersal of women and children and of the old and infirm to billets in the country will also help to relieve congestion. Above all, shelters must be regularly inspected by the M.O.H.

What further provisions can be made to minimise respiratory infections during the coming winter? Can we on the one side raise the resistance of the individual and on the other take measures against respiratory cross-infection? The first need is for an adequate, well-balanced and protective diet. Fortunately the Minister of Food is alive to this, and while no vitamin can lay claim to being specifically anti-infective the addition of vitamins A and D to margarine and of $B_1$ to bread are wise precautions, though C has yet to be taken care of. As a nation we do not eat enough fresh fruit and vegetables, and a supply of synthetic vitamin C might well be made available for those who cannot afford to buy it. There is no evidence that any process of "hardening" by physical exercises, cold baths and the like protects against infection. But chilling and sudden falls in the mean temperature do have an association with colds which in turn may lead to bronchitis or pneumonia, so that the shelters must be warmed and their inhabitants should provide themselves with warm night-attire. If the proportion of children in the shelters is small the principal respiratory infections to be guarded against are colds, influenza, pulmonary tuberculosis and cerebrospinal fever. The infectivity of the first two, the virus diseases, is high, of the others low, but all may be spread by direct contact through droplets ejected while coughing, sneezing or speaking, and most may also be spread under suitable conditions by infective particles carried in air-currents. Direct droplet infection can probably be prevented only by some system of masking, and no doubt an effective mask could be designed which would be cheap and comfortable enough to be accepted as the recognised shelter wear.

The factors which contribute to bacterial pollution of the air are overcrowding, poor ventilation and a dusty atmosphere, and where these are present the risk of air-borne, as opposed to direct droplet, infection will be greatest with diseases of high infectivity like influenza. Artificial ventilation is expensive and not always welcomed when it is installed, but it is having the attention of the authorities. Dust can largely be suppressed by frequent vacuum-cleaning and the application of crude liquid paraffin to the floor once a week.[1] What is wanted now is an effective system of aerial disinfection, and the possibility of using aerosols at once suggests itself. The germicidal aerosol [2] is an antiseptic mixture dissolved in glycerin or similar solvent and forcibly sprayed into the air by a machine which atomises the liquid to extremely small particles. Its effective concentration is amazingly low (1 volume of the liquid to 10–500 million volumes of air) and its bactericidal action is presumably by collision and adsorption between aerosol and bacteria in the air. Particulate matter such as dust interferes with the effect of the aerosol. Further, it must be understood that aerosols cannot prevent the direct spread of infection by droplets. Only a few antiseptics have so far been found to be effective and safe aerosols—among them resorcinol,[3] hexyl-resorcinol [3] and sodium hypochlorite. The last of these is the cheapest, but it is unstable and highly corrosive to metal containers and has other disadvantages.[4] If aerosols become popular difficulties may be experienced in the supply of atomising machines, which will require improvements and adaptations for use in shelters. Moreover, few field tests have so far been performed with aerosols outside the ferret-house. The communal shelters provide an opportunity for controlled tests.

## SILICOSIS REVIEWED

IT is widely thought that silicosis can be produced at will in experimental animals by placing silica dust in their lungs, thus causing them to develop lesions supposedly identical with those found in man. BELT, FERRIS and KING,[5] in a study of the nature of the silicotic nodule, human and experimental, have found what they believe to be distinctive features distinguishing one lesion from the other. The human silicotic nodule is a well-defined pathological entity whose morphology, often described, is essentially constant. Cases derived from many occupations the world over show the same chronic lesions, composed of inert hyalinised fibrous material without evidence of cellular activity except perhaps at the surface. The fibres tend to be concentrically arranged and the outer ones are woven into a heavy collagenous capsule. BELT and his colleagues think that their rat lesions are the same as those produced by other experimentalists, but believe the similarity between the human and animal nodules to be only superficial. The fibres of the animal nodule, they find, are finer, more like reticulum than collagen, looser, less hyalinised, less contracted and less gnarled with age, and they seem to form a network rather than a concentric pattern. The nodule, indeed, is a tangle of fibres and does not develop the "ball of twine" appearance so often referred to in descriptions of the human nodule. The conviction that these differences in appearance are real differences of structure is strengthened by a study of sections which have been submitted to micro-incineration. With dark-field illumination they observed an outer halo of dust enclosing a clear zone containing little or no silica; the clear zone represented the capsule and was a distinctive and almost constant feature of the human lesion. This "zone of redundant fibrosis" is absent from the animal lesions, and may not only be a distinctive structural difference but may conceivably point to some difference in ætiology. They think it possible that the human silicotic nodule is not due entirely to the silica but to some additional factor, possibly infective, acting with it. This conclusion is reminiscent of that of E. H. KETTLE.

KING and BELT [6] have made an analytical study of the silica content of silicotic and non-silicotic tissues. Tissue which contains silicotic nodules invariably shows an excess of silica, but the converse is not always the case. In the lungs of persons dying in several dusty occupations concentrations of silica greatly in excess of the normal were found, often being greater than those in lungs having well-developed silicotic nodulation. The lymph-nodes of normal people dying of old age may also have extremely high contents of silica; the cases in this group had no history of exposure to dusty atmospheres, and the silica deposits must have been derived from the inhaled dust of house and street and transported from the lungs to the lymph tissue, where they had remained, presumably, for many years causing no response beyond the production of a loose network of fibres entangling the particles. This evidence suggests that we need a fuller knowledge of the nature of the dust deposits than is furnished by a chemical analysis for "total silica." Silica occurs in nature in several forms and the inhalation of the dust of some of these—quartz, for example—may be productive of silicosis, whereas the inhalation of others may be relatively harmless. Some additional factor essential to the development of silicosis may possibly be absent from the tissues of the non-silicotic cases.

The pneumonoconiosis of the South Wales coal-field, which has for several years been recognised as a form of silicosis, differs from the classical silicosis of the goldminer. The close relationship between silicosis and tuberculosis, long held to be one of the most characteristic features of the disease, is absent, and the histological appearances of the lesions in the lung are not always characteristic; the nodule may be less densely fibrous and the concentric arrangement of the fibres less marked. New ground has now been explored by GOUGH [7] among coal-trimmers. These men work on the docks and in the holds of ships in an atmosphere which is thick with coal dust. This dust, however, contains a much smaller proportion of siliceous material than that of coalmines, where operations take place in the accompanying rock strata as well as in the coal seams. Coal dust has been thought not to produce serious fibrosis of the lungs, but COLLIS and GILCHRIST [8] have noted that coal-

1. Van den Ende, M., Lush, D. and Edward, D. A. ff. *Lancet*, Aug. 3, 1940, p. 133.
2. See Pulvertaft, R. J. V., Lemon, G. C. and Walker, J. W. *Lancet*, 1939, **1**, 443; also *Lancet*, July 6, 1940, p. 14.
3. Twort, C. C., Baker, A. H., Finn, S. R. and Powell, E. O. *J. Hyg. Camb.* May, 1940, p. 253.
4. Baker, A. H., Finn, S. R., Twort, C. C. *Ibid*, Sept. 1940, p. 560.
5. Belt, T. H., Ferris, A. A. and King, E. J. *J. Path. Bact.* September, 1940, p. 263.
6. King and Belt, *Ibid*, p. 269.
7. Gough, J. *Ibid*, p. 277.
8. Collis, E. L. and Gilchrist, J. C. *J. industr. Hyg.* 1938, **10**, 101.

trimmers not infrequently showed clinical and radiographic evidences of silicosis, and GOUGH considers pneumonoconiosis to have been the main cause of death in the 12 cases he studied. On clinical, radiological, morbid anatomical and histological grounds he maintains that the condition found in these cases is a modified silicosis indistinguishable from that observed in the coalminers. The ætiology of this condition needs further investigation. Is the fibrosis observed due to coal dust itself or to the small amount of siliceous material contained in the coal? Or are two processes at work—one due to coal and the other to silica—each process modifying the other to produce the atypical silicosis found in South Wales?

## THE TEACHING OF PUBLIC HEALTH

STUDENTS should no doubt be taught something of drains, dairies, drinking water and the dust of dried dejecta, but it matters most that for them public health should be linked to clinical medicine and to a wide range of social and economic questions. Only then will public health cease to be a dull impersonal subject and only then will the young doctor realise that his patients are not just medical cases per se but individuals reacting to a complex environment. Two major problems now face preventive medicine—one, the promotion of healthy living which implies the prevention of disease, the other the prevention of incapacity from disease. For working capacity is important not merely as an aspect of national health but as a factor influencing profoundly the health and happiness of the individual. The practitioner must know about methods of preventing disease in order that these may inspire his work—the practice of personal hygiene, application of modern knowledge of nutrition, immunisation against communicable disease, and the like. He must also know how to secure and maintain maximal efficiency in the person whose health is already so damaged that breakdown is certain unless steps are taken to prevent it. Recent advances in medicine have opened up great possibilities, as in the dietetic care and aftercare of patients suffering from alimentary disorders and the nutritional anæmias, in the maintenance therapy of such conditions as diabetes and pernicious anæmia, and in the treatment of a large variety of physical and mental conditions calling for systematic rehabilitative effort, a group bound to assume more compelling importance in the immediate future. Before the war Denmark had elaborated a system of invalidity insurance that provided a wide range of constructive aids to working capacity.[1] There is in fact great need for the development in this country of work along these lines, work in which the universities and teaching schools should take a leading part, linking their departments of public health more closely with clinical medicine on the one hand and with social agencies on the other. There is a vast field for research into the less obtrusive effects of work on health and the assessment of industrial welfare activity; for a significant number of years, for instance, the Miners Welfare Committee has been conducting a major experiment in social science. Let us make sure that the professors of public health in our leading universities are demonstrating to their students that public health is a vital thing and are creating an interest in constructive medicine that will fit them to play their rightful part in shaping health services. Public-health research and teaching must not be bounded by present concepts of local health administration.

1. See *Lancet*, 1940, **1**, 706.

## TETANUS IMMUNISATION ON THE HOME FRONT

IT is perhaps too early to assess the practical effects of the large-scale active immunisation of the Army and the Air Force against tetanus, although Maj.-General H. MARRIAN PERRY has already given some encouraging figures from the Army.[1] He points out that while it is the policy in the Army to give the wounded soldier a dose of tetanus antitoxin whether he has been actively immunised or not the circumstances of the recent campaign in France and Flanders made it impossible to give prophylactic antitoxin to a majority of the wounded; yet the incidence of tetanus was only 0·45 per 1000 which may be contrasted with a rate of 8 per 1000 for the comparable conditions during the first three months of the 1914–18 war. He adds that such cases of tetanus as have been noted have occurred in men who were not actively immunised. That being the case and with the war now being waged on the home front, it becomes an obvious duty to extend active immunisation to as many as possible of those who are, or are likely to be, in the "front line" at home. Among them we think especially just now of the ambulance units, the fire brigades and the A.R.P. demolition squads who have been carrying on so magnificently their rescue work in our bombed towns and cities. The responsibility for their protection rests with hospital and public-health authorities, and already a certain amount of active immunisation has been done amongst them. Another large body of men who may at any time be in the front line is the Home Guard, and after setting such a fine example for the regular army the War Office might well take in hand the immunisation of our country's second line of defence. Active immunisation against tetanus is painless and has many other advantages over passive protection,[2] but it requires an interval of six weeks between the first and second doses, so there is no time to waste in getting the personnel of our home defences immunised.

### WAR PRIMER ON WOUND INFECTION

THE series of articles which appeared in our columns earlier in the year have been made the basis of the Primer on Wound Infection edited by Mr. W. H. Ogilvie, F.R.C.S., which is published this week. The primer aims at stating the problems of infection which everyone engaged on the treatment of casualties, whether military or civilian, has to face, and at giving a simple account of the measures they can take to solve them. The six articles—The Problems by Mr. Ogilvie, Biological Aspects by Colonel L. E. H. Whitby, Bacteriology by Dr. Robert Cruickshank, Antiseptics by Prof. L. P. Garrod, Chemotherapy by Major G. A. H. Buttle and Surgical Principles by Mr. Ogilvie—have been revised by their authors, and to these have been added a section on surgical procedure, including plaster technique, by Mr. Ogilvie, three appendices, on antisera, sulphonamides and the treatment of burns, and an index. The primer costs half a crown (2*s.* 9*d.* post free) and can be had from THE LANCET Office, 7, Adam Street, Adelphi, W.C.2.

1. *Brit. med. J.* Sept. 14, 1940, p. 364.
2. See *Lancet*, 1940, **1**, 1088.

# Annotations

## MEDICINES AND THE PURCHASE TAX

THE section of the Finance Act which creates the purchase tax was to have become operative on Oct. 1, but the date has been postponed to Oct. 21, thus giving an extra three weeks to traders and the customs and excise authorities to complete their preparations for this massive innovation. In general drugs will be subject to the lower rate of duty of 16⅔% of their wholesale price, but "essential drugs of an exceptionally costly character" will be exempted from the tax. The official interpretation of "essential and costly" drugs is a conservative one: it is at present limited to the following items:

Arsphenamine and its derivatives, bromethol, chloroform (anæsthetic), cocaine and salts of cocaine, desoxycorticosterone acetate, ether (anæsthetic), ethyl chloride, hexobarbitone, insulin, liver extract and active principles of liver, hormones, natural or synthetic and preparations thereof, including liver extracts and active principles of liver, and insulin and its compounds with protamine and zinc; oxygen, pituitary extract, procaine and salts of procaine, sulphanilamide and its derivatives, suprarenal cortex extract, sera, vaccines.

In presenting this list the treasury intimated that it was prepared to consider representations from responsible quarters concerning its extension, and discussions are now proceeding between various parties and the Board of Customs and Excise with regard to additions to the list. The Pharmaceutical Society, in particular, has offered its assistance to the authorities in compiling a rational list of drugs for exemption. In order to avoid misunderstanding it will be well to have a list of exempted drugs in which each item is set out under its proper name and every vegetable raw material used in the preparation of medicines should be specified in such a way that there can be no future argument over terminology. Failing specific tabulation it might be laid down that substances which are the subjects of monographs in the British Pharmacopœia and the British Pharmaceutical Codex should be exempted from the tax when purchased bona fide for use as medicines or for the manufacture of medicines or antiseptics.

## THE LYMPHOCYTE

OF all body cells the familiar lymphocyte remains one of the most mysterious, though various rôles have been assigned to it. For most of the suggestions there is some experimental support, but some of them fly in the face of common sense. Thus experiments which tend to show that lymphocytes packed into lymph-glands act as a filter and death-trap for bacteria are supported by clinical knowledge, but when it is claimed that the lymphocyte is a form of defence against tumour cells one can only wonder why the latter grow so well as metastases in lymph-nodes. Professor Florey and his collaborators in Oxford[1] have attempted by isolating the lymphocyte as a single cell to determine its characters and functions. This has required an advance in technique which is now most elaborate. By means of ingenious adaptations of the Sandison-Clark transparent chamber in the rabbit's ear[2] they have found that lymphocytes are more agile than they are commonly supposed to be. Nothing short of constant observation is sufficient to keep a given lymphocyte in view for long periods. For this reason and because rabbits cannot even under anæsthesia be kept still indefinitely the complete life history in the chamber has not yet been followed. Lymphocytes move in straight lines and small circles quite as actively as many polymorphs. They prefer warmth and are probably sensitive to oxygen-lack. During the period of observation none were seen to undergo transformation into any other type of cell—though conditions favouring chronic inflammation existed no lymphocytes were found changing into fibrocytes. Thus no support was given to the view of which Maximow was the best known exponent, that lymphocytes have various developmental capacities. Nor were any signs of phagocytosis seen, although tempting particles of carbon were offered. These negative findings are supported by Medawar,[3] who tried to transform lymphocytes into granular leucocytes in tissue culture after the method of Bloom. The most strikingly successful experiment on this subject was that in which Lang[4] transformed the whole germinal centre of lymph follicles into granular leucocytes by repeated intravenous injections of dead bacilli. This would be an easy experiment to repeat on isolated lymphocytes with the transparent chamber technique, but for the time being war has brought this work to an end.

1. Ebert, R. H., Sanders, A. G. and Florey, H. W. *Brit. J. exp. Path.* August, 1940, p. 212.
2. See *Lancet*, 1939, 2, 939.

## ELECTRICAL CHANGES IN CEREBRAL DAMAGE

THE use of the electroencephalograph is becoming more general in the clinical study of intracranial abnormalities. At first the minute alternations in electrical potential caused by the metabolism of cerebral cells were the affair of the electro-physiologist, but in the last few years electrical changes caused by disease of these cells have been put to practical use. Normally cortical cells, particularly those of the parieto-occipital cortex, show a rhythmic change in electrical potential with a frequency of 8–12 a second. These changes can be amplified electrically, and recorded mechanically. Associated with the well-marked frequencies of about 10 a second are many underlying waves of lower voltage and varying rate. Some, seen particularly in the parietal lobes, occur about 20 times a second, while others have a duration of two to three seconds. These slow waves are normally absent or of so low voltage as to be insignificant, but in any condition affecting the normal behaviour of cerebral cells their size increases and they may submerge the faster waves and convert the normal electroencephalogram, with its rhythmic spindles of 10 a second waves, into an undulating series of slow oscillations, ranging from slow rollers lasting for two seconds to the more usual "delta" waves of 2–5 a second. These abnormal slow waves are seen around areas of cortical damage, and can be used to locate such diverse lesions as tumours, abscesses, and hæmatomas.[5] They have been employed for the last two or three years in the routine investigation of cerebral lesions and their value as an ancillary diagnostic aid has become established.[6] Although they arise in damaged cortex they can be produced experimentally and are reversible.[7]

Now Jasper, Kershman and Elvidge[8] have applied these slow waves to the diagnosis and management of cerebral injuries. They have investigated 37 patients with acute head injuries, and 23 with the late effects of such injuries. They confirm the earlier reports that cerebral damage is associated with slow waves and conclude that the amount of type of slow activity are the best single measure of the severity of cortical damage. In their most severe cases the electroencephalograms were composed entirely of abnormal slow waves with no trace of the normal rhythm. Although improvement in the clinical state and in the electrical record were concomitant, abnormal waves persisted after symptoms had disappeared, and the authors suggest that highly integrated psychological testing might lay bare abnormalities in behaviour and mood due to the residual damage repre-

3. Medawar, J. *Brit. J. exp. Path.* August, 1940, p. 205.
4. Lang, F. *Z. mikr.-anat. Forsch.* 1926, 4, 417.
5. Walter, W. G. *J. Neurol. Psychiat.* 1938, 1, 359.
6. Williams, D. J. and Gibbs, F. A. *Arch. Neurol. Psychiat.* 1939, 41, 519.
7. Williams, *Brain*, 1939, 62, 321.
8. Jasper, H. H., Kershman, J. and Elvidge, A. *Arch. Neurol. Psychiat.* August, 1940, p. 328.

sented by the delta waves. On the other hand some cases without signs of organic damage who had psychoneurotic symptoms showed no abnormality. Jasper and his colleagues claim that the method may thus be used in the differentiation of purely psychological changes from the physical sequelæ of trauma, and that by using a special technique the nature of the lesion may sometimes be hazarded. Similar observations are being made on material which the war has made available in this country, and it will be interesting if these conclusions are substantiated. Even if the method is not found infallible it has already shown itself a useful adjunct to accurate clinical observation, and as knowledge increases it will gradually come into more general use.

## CHEMISTRY AND MEDICINE

"Whirr! Whirr! All by wheels! Whiz! Whiz! All by steam!" Thus exclaimed the pasha transported with delight by Kinglake's references to the inventive genius of the western world. After the lapse of a mere century we find that the wheels and the steam which excited the imagination of a previous generation have been succeeded by a quiet reverence for the mysteries of natural science. The cultured laity, modern counterpart of the pasha, have for some years been under the spell of the Eddingtons, the Jeanses and the Huxleys who live in the cold pure light of fundamental knowledge. How satisfying it is to explain the characteristic curvature of the blade of grass in terms of plant hormones! The crowning glory of a sunset is now reduced to a consideration of the spectrum and dust particles. Even in the nursery the merits of heavy water are discussed now that the doctrine of free will is démodé. On one thing all are agreed—that where there is no chemistry the people perish. There could be no more eloquent testimony to the value of chemistry than the volume of papers[1] presented at the fiftieth anniversary of the founding of the medical school of the University of Minnesota. Under the editorship of Prof. Maurice B. Visscher reviews are published on physical chemistry in medicine, investigations in metabolism, aspects of immunity and chemotherapy, and the nervous control of the organism. The writers are men who have earned recognition as researchers, and they present their own work in proper perspective against a background of selected literature. Dr. Johnson said that the only book that ever took him out of bed two hours sooner than he wished to rise was Burton's Anatomy of Melancholy; this is another such book. It will make an instant appeal to clinical scientists who have a bias towards physiological chemistry, but the neurologist and the bacteriologist will also find here a number of fascinating papers. To take one of the many, Prof. H. F. Helmholtz, writing on chemistry in urinary antisepsis briefly surveys the progress which has been made since Bokai in 1878 first tried to eradicate urinary infections by altering the reaction of the urine, and he leads the reader step by step from the acidifiers and alkalinisers to hexamine, which still stands out clearly as a landmark in the science of urology. He drops a few pithy remarks about salol, acriflavine and Pyridium and comments in more detail on the ketogenic diet and mandelic acid. These resemble hexamine in requiring a pH of about 5·5 for their actions to develop. Any of them may fail for two reasons: impaired renal function may prevent the excretion either of the antiseptic in sufficiently high concentration or of a urine of sufficiently low pH; and failure may also be due to the presence of infecting organisms which produce an alkalinity of the urine despite the administration of acid and acid-forming salts. Helmholtz points out that an organic acid which in the same concentrations would give a bactericidal urine at a higher pH would be valuable. Remarking that sulphanilamide fits into "the weakest spot of our armamentarium in the treatment of infection of the urinary tract" he goes on to remind us of J. R. Sickler's important discovery that some strains of bacteria are killed readily by low concentrations of sulphanilamide and that other strains are resistant to much higher concentrations.

1. Chemistry and Medicine. Minneapolis: University of Minnesota Press. Pp. 296. 28s.

## EAR PLUGS

THE Ministry of Health has decided to issue ear plugs to the armed forces and the civilian population. Civilians will receive them, as they received their gas-masks, from the local A.R.P. wardens who are supplied by the A.R.P. department of the local authority. It is understood that the plug is to be similar to the Mallock-Armstrong device. The official description is as follows: "The plug consists of a hollow tapered rubber plug with a rim at one end to which a piece of string can be fastened. When worn the plugs do not seriously interfere with the hearing of ordinary speech, &c., but they reduce the crash and concussion of explosives. Their object is not so much to obviate physical damage to the ear as to prevent the shattering effect of noise on the nerves. The plug should be slightly moistened before being inserted in the ear . . ."; then follow precise instructions for doing this and for clean storage. If the plug does not fit it is to be whittled to shape with a razor blade or scissors. The first issue is free, and replacement will cost twopence a pair. The chief differences from the Mallock-Armstrong plug are the material (rubber instead of vulcanite), the shape (a truncated cone instead of a Halma man), uniformity of size, and the absence of a gauze net and filter at the outer end. These differences may have been made to avoid infringements of patent rights or may be simplifications for ease of mass production. The first three are probably of little practical significance, but the gauze net and filter are claimed to be an important part of the Mallock-Armstrong plug because they prevent any alterations of air pressure passing through to the drum. The Ministry clearly state, however, in their official description that they are not attempting to protect the population against physical damage to the ear. Whether they are quite justified in thus disclaiming responsibility is questionable, at any rate on medical grounds. The proprietary plug was successful in the last war and has since been used in industry. If the gauze net and filter really do give the necessary protection (and experiment would prove this easily enough) it is difficult to understand why they have not been incorporated in the official plugs. Difficulties of manufacture could doubtless be overcome. Perhaps it is not too late for the Ministry's experts to give this point further consideration.

## VIRULENCE OF THE DIPHTHERIA BACILLUS

MANY of the patients admitted to isolation hospitals as diphtheria have atypical clinical conditions including suspected nasal and aural diphtheria; in a proportion there are no clinical signs of infection. It is therefore important to establish the toxigenicity of organisms morphologically resembling *Corynebacterium diphtheriæ* which may be isolated from the throat, nose or ear of such cases. In the past virulence-testing was usually the final stage in a process which began with the discovery of a diphtheria-like bacillus on a Loeffler slope; the culture was plated on a tellurite-containing medium, colonies were picked on to serum-agar from which subcultures were made in Hiss's serum-water containing glucose and saccharose, and if glucose but not saccharose was fermented a saline suspension of the organism was inoculated subcutaneously into the axilla of a guineapig; death of the animal within three days with pleural effusion and congested or hæmorrhagic suprarenals was evidence of a toxigenic strain. The whole procedure was

time-consuming and not uniformly reliable. In recent years the use of the intradermal virulence test and the recognition of three main biological types of the diphtheria bacillus, which can often be recognised by their colonial appearance on blood- or serum-tellurite-agar, have considerably quickened and simplified the division of *C. diphtheriæ* into virulent and non-virulent forms. Mair[1] has shown in the examination of several thousand strains that almost all starch-fermenting and "barred" or intermediate forms are toxigenic, so that if swabs are plated directly on a blood-tellurite medium like that of Neill,[2] and if atypical colonies are further tested for their fermentation reactions, a large proportion of strains can be reported as virulent in 2–3 days' time. There remains the mitis group, and since some 10% of these are non-virulent all should be tested for virulence. Mair's[3] intradermal technique is as follows: 0·2 c.cm. of a freshly prepared saline suspension containing approximately 500 million organisms per c.cm. are injected into the skin of a guineapig weighing 300–400 g. and immediately afterwards 1 unit of antitoxin per 50 g. body-weight is given. This can be read in 1–2 days and the results are reliable. Alternatively, a 24-hours' broth culture can be used although with it the lesions are more diffuse. With the subcutaneous method and a small inoculum anomalous results have been obtained for which Holt and Wright[4] have lately suggested an explanation. They have found that normal saline has a bactericidal action on the diphtheria bacillus as it was already known to have on the pneumococcus, meningococcus and hæmolytic streptococcus, and for the subcutaneous virulence test they suggest injection of the whole of a good-sized Loeffler-slope culture suspended in 3 c.cm. of broth. As they point out, saline has often been used as a diluent in virulence tests and for assessing the effects of antiseptics and chemotherapeutic drugs without much consideration of its effects. Alternative and harmless bacterial diluents are 0·1% gelatin, serum and peptone, the value of which may depend on the nutriment they provide; but for the maintenance of a physiologically normal bacterial population Holt and Wright think that salt-balance, including phosphates and calcium, may be important. They have rendered a service both to the bacteriologist and the clinician in showing that the subcutaneous virulence test for *C. diphtheriæ* can be relied on if the inoculum is large and suitably suspended.

## THE MOTOR CORTEX

IT has long been asserted in standard textbooks of anatomy that the body is represented in the precentral gyrus as if it were standing on its head with the face at the bottom of the gyrus and the feet at the top. Dr. John E. Scarff's observations,[5] based on fourteen epileptics, demonstrate that there has been an upward displacement of the centres which make up the area, with the result that those which control the lower limb have been pushed over the upper border on to the medial surface, together with those for the perineal region. In thirteen of Dr. Scarff's subjects the proof was negative; that is, he elicited arm movements but never leg movements from stimulation over a wide area of the lateral aspect extending up to the medial border. The presence of the great longitudinal sinus and its tributary veins, and of pacchionian bodies, makes the approach to the medial aspect difficult and dangerous, but in one patient he was able to overcome these difficulties, and by stimulation to produce positive responses in the lower limb. Focal contraction of the rectal sphincter was also obtained repeatedly by stimulation of the surface in the neighbourhood of the gyrus cinguli. These observations are in accord with those of Penfield and Boldrey in their classic paper[6] to which Dr. Scarff has done rather less than justice. In studies of 163 patients they showed conclusively that the upper-limb area extends to the medial border of the hemisphere. They found that the lower limb and trunk responded only rarely to stimulation of the lateral aspect and concluded that "more responses would have been obtained had it been feasible to stimulate the edge of the hemisphere and the mesial surface in the median longitudinal fissure more frequently." The danger of bleeding made this procedure inadvisable unless clearly necessary. Nevertheless, they were able in some cases to expose this surface and demonstrate leg movements. Their findings differ from those of Scarff in that they did obtain, though rarely, some positive lower-limb responses from the upper part of the lateral aspect. There is in fact a considerable overlap of areas in the precentral gyrus, and voluntary muscles respond also, though less often, to stimulation of similar levels on the postcentral gyrus; so that, as Penfield says, it is impossible to confine functional representation to strict cytoarchitectural boundaries.

"This upward migration of the primary motor strip," says Dr. Scarff, "is unique in man." But considerable shifting has taken place in the motor area of the cortex in the course of evolution. In lower animals the centres lie anteroposteriorly, and a pivotal movement has occurred, in which the leg has maintained its position at the medial border, while the head has swung downwards beneath it, thereby achieving the coronal disposition and arrangement found in monkeys and hitherto attributed to man. It is probable that the liberation of the arm with all its varied and delicate movements and the development of vocalisation into articulate speech have caused the further expansion which has finally pushed the leg centres "over the top."

## CONSUMPTIVES NOT TO SLIP INTO THE ARMY

THE Minister of National Service has decided to ask every examinee who comes before a medical board for enlistment to sign a declaration that he has not at any time suffered from tuberculosis. This will certainly be some safeguard against consumptives slipping into the Army. But memory is never so fallacious as when presented suddenly with something to sign and the Minister of Health is taking the precaution of asking M.O.H.'s to supply the local officer of the other ministry with the names of all male persons born in the years 1920 and 1921 or between 1900 and 1907 inclusive who have been registered by them as suffering at any time from tuberculosis. This will eliminate another batch of these undesirable recruits. There is no mention in the circular (No. 2169) of the well-recognised value of mass radiography.

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The University of Oxford has conferred the honorary degree of doctor on Prof. MARIANO R. CASTEX at the British Embassy in Buenos Aires. Dr. Castex has been head of the department of clinical medicine in the University of Buenos Aires for twenty-seven years and has come to be recognised there as the consultant's consultant.

Prof. HARRY PLATT has been appointed assistant consultant adviser in orthopædic surgery to the E.M.S. and Mr. J. RHAIADR JONES honorary adviser in rehabilitation. Mr. Jones is manager of the Derwen Cripples Training College at Oswestry.

We regret to announce the death this month on active service of Colonel ARNOLD GIBSON, L.D.S., assistant director of dental services to the Eastern Command.

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1. Mair, W. *J. Path. Bact.* 1936, **42**, 635.
2. Neill, G. A. W. *J. Hyg. Camb.* 1937, **37**, 552.
3. Mair, W. *J. Path. Bact.* 1930, **33**, 230.
4. Holt, H. D. and Wright, H. D. *Ibid*, September, 1940, p. 287.
5. *Arch. Neurol. Psychiat., Chicago*, August, 1940, p. 243.
6. Penfield, W. and Boldrey, E. *Brain*, 1937, p. 389.

## Special Articles

# FUTURE OF THE FAMILY DOCTOR

BY DOUGLAS HUBBLE, M.D. Lond.
PHYSICIAN TO THE DERBYSHIRE HOSPITAL FOR SICK CHILDREN

THE nineteenth century saw the family doctor at the peak of his influence. Stephen Paget has written of him in the person of his father-in-law, Dr. Velox, who had "a huge practice in the Midlands. By day and night, by road and rail, he drove his influence to every point of the compass, into half a dozen towns and fifty villages; a masterful man, dominant and positive, a born fighter, loving to besiege, in all honour and by declared war, the strongholds of other men. For thirty years he did without a holiday, never afraid of the rush of the day's work, the night-calls, the meals got anyhow, the nearness of a breakdown; then, victory, and a stately practice, unassailable, fortified in authority: at last, his name a household word, his face known everywhere, his presence felt, his anger dreaded, his verdict final, and no wonder, for there was no sounder judge of an obscure case, not in all England. For thirty miles round he was the man to have. In every country-house, in time of peril, the cry was, 'Send for Velox.'"

Like all Victorian portraits, drawn before Lytton Strachey taught the Georgians the art of denigration this Dr. Velox seems a little more than life-size. We are not told that he was intolerant of criticism and inclined to despise the opinion of his colleagues, that his superb self-confidence was often uncertainly poised, that his social conscience was negligible since he was entirely content with life as it was, and that he handed on to our unwilling and unworthy shoulders a load of infallibility under which we have been struggling in embarrassment every since. To-day the work and outlook of the family doctor have changed in the same degree as his environment.

### THE CHANGING TASK

The growth of the public health services has subtracted much from his work. He has, speaking generally, no part in the antenatal services, the infant-welfare centres and the school medical services. This has not only seriously diminished his value and experience but it has set up against him another group of doctors whose function is to supervise growth and nutrition while he, for the most part, sees the family only in gross departures from health.

The increasing growth of specialism, made necessary by the advance of medicine, has also made great inroads on his work. Fifty years ago the family doctor was physician, surgeon, accoucheur. What claim today has he to any of these titles? A London surgeon wrote derisively four years ago (*Lancet*, 1936, **2**, 462) of the man who confides in moments of expansion that he likes to do a spot of surgery occasionally, as he would say that he likes to play a spot of golf. "Operating as a sport," he remarked, "is a purely British conception, and its home is the cottage hospital." There is universal agreement that the satisfactory practice of general surgery or any of the surgical specialties demands whole-time service. Surgeon, no more!

His claim to the title of accoucheur steadily decreases. The Scottish Health Services Report (1936) relates that of the 544 panel doctors in Glasgow more than a quarter do no midwifery at all and only 1 doctor in 8 (i.e. 68) attends 20 or more cases in a year. That is to say that in an urban area only 12% of the doctors working under the N.H.I. do sufficient midwifery to maintain a reasonably high standard of obstetric performance. It is probable that doctors working in rural areas and those engaged in middle-class family practice have greater obstetric experience, although even in such circumstances it is vastly less than it was only thirty years ago. The reasons for the decline in the family doctor's obstetrics are well known; they are the falling birth-rate, the growth of institutional midwifery and the increasing numbers of trained midwives.

He can view without regret the loss of surgical practice because it has brought nothing but gain to his patients; he may console himself for the diminution in obstetric practice by the increased leisure it gives him and the load of anxiety which it takes from him, but he cannot but deplore his restricted opportunities to become a good general physician. It is here that the lack of access to diagnostic facilities hits him hardest. His wealthier patients give him full opportunity for investigation, but his poorer patients inevitably leave his hands.

### NATIONAL HEALTH INSURANCE

N.H.I. might do much to give him back his birthright; the restoration of lost clinical opportunity begins to be more important than the height of the capitation fee. What is his present function? Let P.E.P.,[1] a disinterested critic who believes that the future organisation of the health services in this country must be based on the family doctor, give the answer:

> "General practitioners are being taught at great trouble and expense to use modern diagnostic equipment, to know the available resources of medicine, to exercise judgment as between patient and specialist, only to be launched out into a system which too often will not permit them to do their job properly. Excessive numbers of panel patients and excessive demands for certificates and returns of all kinds quickly reduce the general practitioner to an agent for making out prescriptions (too often for mere palliatives), and for operating something more like a sickness licensing and registration system than a health service."

Many say that the next great step in the improvement of the nation's health services will be an extension of N.H.I.; it therefore becomes vitally important to assess the faults and virtues of the system. Its merits are that it has given the worker some degree of financial security in sickness, that it has given him easy access to a family doctor, and that it has improved the financial stability of many doctors in rural and industrial areas. It fails, however, to give a complete health service to the worker or an adequate opportunity to the family doctor, because it makes no provision for pathological, radiological or consultant services. The family doctor is thus left without facilities for diagnosis or opportunities for educative contacts with experts. All important work in the diagnosis and treatment of insured patients is done in voluntary and public-assistance hospitals by doctors who have no part in N.H.I. Moreover, the scheme was not designed primarily to improve the health of the workers and therefore has never been a sound clinical organisation; no clinical supervision is exercised, and there is no attempt to see that a high clinical standard of diagnosis and treatment is maintained. It often appears that the Ministry's interest in the performance of doctors is focused on the accuracy of their records and the cost of their prescribing. N.H.I. fails to make use of the full powers of the family doctor, neglects the hospitals and ignores the consultants, and any health service which does these things is no health service at all.

### HIS PLACE AS GENERAL PHYSICIAN

Is it important that the family doctor should do something more than run "a sickness licensing and registration system"? What form of organisation will give him the best opportunity to serve the family? It is generally agreed that he has before him an extending field of work, and with these enhanced opportunities must come higher standards of selection, of training, of equipment and of performance. His function is to be the family's health adviser and the liaison officer between the patient and the specialist, the hospitals and the public-health services. P.E.P., with great vision, defines the family doctor as the "specialist in diagnosis," and goes on:

> "The possible causes of ill-health are so intimately bound up with the way of life of the individual that it is impossible to have a satisfactory health service in which diagnosis and responsibility for treatment are undertaken in ignorance of the family and working background of the patient. On the

1. Political and Economic Planning, (16, Queen Anne's Gate, London, S.W.1), which in 1937 produced a comprehensive report on the British health services to which I am indebted for much of my information.

other hand, the complexity of modern medicine is such that it becomes one of the most important functions of the general practitioner to make the best use of the specialist services available to him."

The need for the general physician is illustrated in this true story of six specialists and no doctor.

There was a man with inframammary pain who betook himself to a cardiologist, who suspected a spinal-cord lesion and sent him to a neurologist, who diagnosed spinal osteo-arthritis and sent him to a radiologist whose X rays revealed nothing. Check. Being still in pain he went a little later to a chest specialist who discovered nothing but suspected a psychoneurosis and sent him to a psychiatrist who refused to get to work until the man had been to a clinical pathologist who reported that all blood examinations were normal The patient returned to the psychiatrist and was still in conference with him when last heard of.

The training, work, and interests of the family doctor of the future must be those of a general physician. There are some who believe that he should carry on the practice of a small specialty in addition to his ordinary work. Others suggest a small grouping of family doctors round a small diagnostic and therapeutic clinic. Such attempts cannot be ultimately successful in the face of a rapidly increasing specialism; there are already sufficient whole-time specialists to make the pursuit of a part-time specialty unproductive. In general medicine he has a legitimate field with steadily increasing opportunities for diagnosis and treatment. The advances of medicine in the last twenty years have been such that it is easily possible for the provincial family doctor of today to be a more efficient physician than the Osler of yesterday. It should not be assumed that this knowledge is too recondite for him. It will, no doubt, demand some alteration in his training, the essential parts of which will be general medicine, obstetrics, diseases of infancy and childhood, and psychological disorders, with diagnosis in the special departments, including surgery.

### A FAMILY MEDICAL SERVICE

How shall these doctors be employed in the service of the family? Much disinterested opinion supports the extension of N.H.I. to the dependants of insured workers. This suggestion has obvious advantages but I believe it would be a disaster unless accompanied by vital changes in the N.H.I. The family medical service must be a health service while the N.H.I. is fundamentally a sickness service. If the N.H.I. were extended to include the family it would perpetuate indefinitely the schism between the public-health service and the private-doctor service. An increasing number of people look to some kind of state medical service as the health organisation of the future. I do not doubt that the state must soon accept full responsibility for the health of mothers and children.

Overlapping under the present system is illustrated by a characteristic example:

A pregnant woman is attended in sickness by a Dr. A, though Dr. B is doing the antenatal examinations and midwife C will conduct the confinement. After delivery, Dr. A attends both mother and child in sickness, but the child is taken to an infant-welfare centre for advice on diet, and is there supervised by Dr. D; either Dr. A or D may, and often does, refer the child to a local hospital where it is seen by Dr. E who may refer it back to Dr. A; or the child may become a chronic outpatient under a succession of house-physicians, Dr. F°. At school medical inspections the child is examined by Dr. G and possibly later by Dr. H. At the age of 14 he is given the right to choose his own doctor and, with characteristic independence, discards the family doctor, old A (of whom it is true he has seen woefully little) in favour of Dr. I.

A plan is outlined below for the organisation of a state family medical service; the fact that such a service would exist side by side with the N.H.I. would give rise to what P.E.P. calls an "unfortunate administrative dualism." It would, however, have the great compensating advantage that it permits of the *gradual* introduction of state control into both hospitals and private practice. In this way hardship would be eliminated and mistakes minimised, and it should be possible to retain much of what was best in the old system. It may be reckoned a demerit of this scheme that the father and the family have a place in two separate medical services, but I think this is better than including obstetrics and child health in a system which has the ineradicable inadequacies of the N.H.I.

### SCOPE OF THE SERVICE

A family medical service must be a health service with a clinical organisation. It will be concerned with the health of the pregnant woman, conduct of child-birth, care of the child through its first dangerous months, full restoration of the mother to well-being, regular observation of the child's physical and mental growth, recognition of abnormalities and the remedial treatment of defects, and care of the mother and child in sickness. Its organisation must embrace obstetric units and control the available children's and obstetric beds in all hospitals. It must command the services of all necessary specialists, and adapt the present work done in antenatal clinics, infant-welfare centres and in school medical inspections, while extending the family doctor's domiciliary service. It must have the fullest possible liaison with the educational authorities, with the schools and the teachers, with all the voluntary organisations which take a hand in the development of the child's mind and body. And it must be based on four essential principles:

1. It must be regional in administration and elastic in construction. It cannot be limited by local government boundaries and it is impossible to devise one scheme which will satisfy the needs of such diverse areas as, let us say, Birmingham and Bournemouth, Glasgow and Ross and Cromarty, Caernarvonshire and the East End of London. This principle of elasticity within a regional executive is already accepted and is working well in the emergency hospital services.
2. It must be based on the hospitals, voluntary and public.
3. It must provide for what Osler called "the continuous education of the family doctor." This cannot be attained by a fortnight's postgraduate course once every five years in some distant city.
4. The regional directors and assistant directors of the scheme must be clinicians engaged in active practice. In no other way will the full coöperation of the family doctors be obtained. Bureaucrats, with or without a medical degree, will never command the loyalty that the practising clinician on the spot will elicit.

These principles underlie the following outline of a family medical service. The plan is given dogmatically not because it is regarded as the only possible scheme but to give a basis for thought and discussion.

### THE UNIT

The foundation of the service must be the family doctor. At least ten thousand family doctors would be required for it in Great Britain and they would be drawn from the ranks of the existing family doctors and from those doctors now doing antenatal, infant-welfare and school medical clinics. It must be a young service; only men and women under the age of 40 would be accepted and the retiring age would be 45 for the family doctor, 50 for the group-directors and 55 for the regional directors. Doctors in retirement would be allowed to go into panel or private practice; but a recognition that obstetrics and pædiatrics demand minds and bodies that have not yet reached the arteriosclerotic years is essential. Special experience in obstetrics and child health must be demanded of all entrants at the inception of the scheme.

The family doctor would have care of a group of, let us say, a thousand children up to the age of 16, together with their mothers. The number of mothers might vary between 500 and 700, depending on factors affecting the birth-rate. Such a group would constitute a unit and would represent the maximum complement of any one doctor. It would probably be necessary to allow doctors in some circumstances to serve less than one unit, but possibly never less than half a unit. The doctor's time might then be occupied also both with N.H.I. and private practice. As long as there is a demand for private practice it should be open to doctors in the family medical service, though it might be wise to limit it to practice amongst mothers and children. The charge of a unit would allow leisure for private practice or hospital work. It would also be necessary to restrict

the individual's right to a doctor of his own choice; there are, of course, many factors which even to-day limit his choice considerably. It should be possible to permit changes of doctor in most areas if adequate reasons were given.

Each unit would average about 70 childbirths a year. All these would be under the supervision of the doctor, but he would not conduct the confinement, although his attendance at least once during each childbirth would be obligatory. He would do all antenatal examinations in the presence of the midwife who would later conduct the delivery. The doctor's attendance would also be required for anæsthetics, beyond gas-and-air analgesia, and for difficulties during labour.

The family medical service would find its chief justification in the care of the infant during its first six months of life. McNeil maintains that the heavy infant-mortality after the first fortnight of life is largely due to the mismanagement of feeding, especially of breast-feeding. The management of the baby must be a direct concern of the doctor; it should not be left to the nurse.

The doctor in the family medical service will see the children in his unit at short regular intervals through the first year and, at gradually longer intervals, up to 5 years. These examinations will be made either at the public clinics, or, in some localities, at the doctor's house. There will be an opportunity for important diagnostic and therapeutic procedures—for example, the estimation of hæmoglobin at intervals during the first year, tuberculin-testing and diphtheria-immunisation during the second year. In this age-period from 1 to 5 years there is too often a lack of medical supervision. It is a period, moreover, when many psychological difficulties appear to be sown. The child's progress from egotism through family membership to communal sensibility is a journey of many mental and physical hazards and the family doctor should be qualified to give the necessary pilotage.

Medical examination of the child in later years will take place at school, usually in consultation with the school-master or mistress.

The service will include children up to the age of 16, the statutory school-leaving age; children aged 14–16 in employment are now included in the N.H.I.

The doctor's morning will be spent in visits which may average ten a day, three of which will probably be postnatal visits. His afternoons will be spent doing antenatal examinations (one clinic a fortnight), school medical examinations (one clinic a fortnight during the school term), infant consultations (one clinic a week) and regular examinations for children of the ages of 1–5 (one clinic a week).

Continuous education of the family doctor will be provided for in the hospital service attached to his group. Here he will act as clinical assistant for three months at regular intervals; post-mortem attendance, clinical conferences and ward rounds will be made available for him at all times. He will be able to make use of a complete consulting service, and will thus keep abreast of advancing medicine and maintain undimmed his early enthusiasm. A surplus medical staff will be necessary to act as locum tenens for holidays and sickness leave, and for relief work during times of epidemic disease. This staff will be drawn from young doctors who are not yet settled in the service and from those who have retired from it.

### THE PLACE OF CONSULTANTS

For every group of 25 units (25,000 children and their mothers) there might be one group director with two assistant-directors. Ideally, the group director would be a physician in charge of children's beds in the local hospitals; he would presumably be denied the right to any private practice other than consulting practice as a pædiatrician. Both the assistant-directors would themselves be in charge of units; one of them with special experience of obstetrics and an appointment as obstetrician on a hospital staff would act also as obstetrical consultant for the group; while the other would be a physician, also with a hospital appointment.

Regional directors would be in control of a varying number of groups depending on local circumstances; it would probably be necessary to have regional obstetric directors in addition. These directors, though some of their work must be administrative, would be active members of hospital staffs and a preponderating part of their work would be consultant and clinical. They would include a general surgeon, a psychologist, a pathologist, a radiologist, an orthopædic surgeon, an ear-nose-and-throat surgeon, an ophthalmologist and a dental surgeon. The posts would be salaried, but recognised as part-time, and consultants would have access to whatever private practice was available.

Since much of this consulting work would actually be done in hospitals, the state would be given more control of voluntary and public hospitals than it has today. The service must control the necessary hospital beds and many of the hospital physicians and surgeons would be in the service as consultants or directors. At a rough calculation each unit of the family medical service would require two obstetric beds and two children's beds. The whole service, at this calculation, would require at least 40,000 beds, which is half the total number of beds available today in the voluntary hospitals. Probably less than a third of all the beds in voluntary hospitals are reserved for obstetrics and diseases of children, so a considerable number of beds for the family medical service would have to be found in the public hospitals where a large part of the country's institutional midwifery is already being conducted.

### COST OF THE SCHEME

If the rates of pay prevailing in the public-health services were regarded as a basis salaries might be expected to range between £650 and £1500 a year. Even if most grades in the service had a limited amount of private practice in addition it is likely that the average net income of the family doctors would show a reduction of some hundreds of pounds a year. Against this would be set certain not inconsiderable advantages—a pension, increased security, more leisure, and improved standards of work. Moreover, in the next few years all of us will become accustomed to contracted standards of living and expenditure. An approximate calculation gives £24,000,000 per annum as the cost of such a family medical service to the state. If this sum cannot be found by the state, why should it not, for the main part, be found by the workers? It seems probable that a system of family allowances may be the next big social reform. As a quid pro quo the state might require from fathers a contribution towards the cost of the family medical service. Contributions might be on about the same scale as those to public medical services run by groups of doctors. Contributory schemes are popular, as the success of the hospital contributory schemes has shown. Each unit, if composed of 1000 children and 750 mothers, would produce £1300 p.a. at a rate of 4*d.* a week for each mother and 3*d.* a week for each child. The local authorities and the state would thus be left to find £11,000,000 a year; but the local authorities are already spending half this sum in their maternity, child-welfare and school medical services and in the upkeep of obstetric and children's beds in their public hospitals. The eventual cost to the state of providing an efficient family medical service might be between five and six million pounds a year. The scheme would prepare the ground for a further extension of the state medical services when that was considered desirable but such an extension need not be regarded as urgent, seeing that the family medical service would be working to ensure the full health of the next generation in so far as that was consistent with the environment of each individual.

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From the Instituo de Medicina Social of Peru comes a monograph compiled by two of its staff, Dr. Soldan and Dr. Kuczynski-Godard, which will appeal not only to the medical man in the reader, though it is addressed to him, but also to the potential traveller who lives in most of us. It is the series of photographs illustrating the life of a tribe of Indians in a little-known forest region of Peru which gives the monograph its fascination. A remarkable diversity of human types is found within the limits of this single tribe. Negro, Mongolian, Jewish and European faces are all there, including one which would have served as a model for Piero della Francesca. Besides the people the monograph tells us about their houses, habits and diseases, as well as the country they inhabit, and the authors survey the medical problems raised by the presence of a primitive community in the midst of a much more advanced civilisation.

## CHANGES IN THE E.M.S.

THE terms of service in the Emergency Medical Service have lately been modified to suit the unexpected course of the war. The group officers of the London sectors, while retaining their present title, have taken over some of the former duties of hospital officers; they will arrange movements of patients, staff and equipment, control the use to which the various hospitals are put and advise on upgrading. Problems of transport between hospitals, however, remain in the hands of the hospital officers and their deputies, the medical officers of health in the various districts, who will also retain their control over first-aid posts and other A.R.P. activities.

The hospital officer for London will continue to supervise the first-aid and ambulance service and the work of the casualty bureaux in the region, as well as inter-hospital transport. The outlying sector hospitals will be primarily under the control of the group officer of the sector, who will discuss with the regional hospital officers concerned plans for the use of these hospitals, and for the transfer of patients from sector to sector or to neighbouring regions. Mr. C. H. S. Frankau, F.R.C.S., has the task of coördinating the work of the London sectors and the regions round London; he is assisted by Dr. W. J. Gill, on behalf of the L.C.C. and other municipal bodies, and Dr. R. E. Bonham Carter, on behalf of the voluntary hospitals. Group officers will still work in close touch with the municipal medical officers, and any instructions to municipal hospitals will normally be addressed to the M.O.H. rather than the medical superintendent of the hospital concerned. When urgency makes it necessary to send instructions to the superintendent the M.O.H. will be informed as soon as possible.

The following changes in the terms of service of class-3 officers have been approved by the Minister:

The limit of two sessions daily and the maximum quarterly fees of 120 and 75 guineas have been withdrawn; the maximum consultant fees for six months will be 240 guineas and for general practitioners 150 guineas, computed on the basic sessional fees which remain unaltered.

The advisory emergency hospital medical service committee have undertaken that practitioners will give service as may be necessary for the remainder of the half year after the maximum fees have been earned.

When a practitioner normally attends a hospital which is on the occupied-bed basis whenever there are patients requiring treatment within his specialty his fee will be derived from the pool provided by the capitation fees. Where he is summoned only when required he will be paid on a sessional basis.

Administrative work undertaken at the request of the hospital officer will be paid for at the appropriate sessional rate.

The separate sessional fee and mileage rate is to be replaced by a combined fee covering medical attendance and travelling costs. A scale has been drawn up beginning at 2½ guineas for specialists and 1½ guineas for general practitioners per session where the hospital is within two miles of the doctor's home and rising by 6d. per session for every extra mile up to eighteen.

The terms of service for class-1 and class-2 officers have not yet been decided, and their appointments are for the most part being extended on existing terms until the beginning of December.

## VOLUNTARY HEALTH INSURANCE IN U.S.A.

(FROM OUR OWN CORRESPONDENT)

A YEAR ago (*Lancet*, 1939, **2**, 447) I described the genesis of a national association of medical groups concerned with the distribution of medical care on a voluntary insurance basis. At a conference in New York that July all those experimenters met for the first time and considered the difficulties of organising for group practice under existing state laws. At this conference Prof. J. P. Peters and Dr. Hugh Cabot upheld the ideal of good medical practice which the latter suggested they would not get so long as the emphasis was on age, experience and whiskers. The charter members of these groups were:

Civic medical center, Chicago, Ill.; Farmers union cooperative hospital, Elk City, Oklahoma; Group health association of Washington, D.C.; Greenbelt health association, Greenbelt, Md.; Group health association of New York; Group health mutual, St. Paul, Minn.; Milwaukee medical center, Milwaukee, Wis.; Ross-Loos medical group, Los Angeles, Calif.; Trinity hospital, Little Rock, Ark.; Wage earners health association, St. Louis, Mo.

At the first meeting of the new association, which is called Group Health Federation of America, the following officers were elected: Dr. Mahlon D. Ogden (Little Rock), president, Dr. H. Clifford Loos (Los Angeles) and Dr. Michael Shadid (Elk City) vice-presidents, Charles A. Marlies (New York), secretary-treasurer, and Martin W. Brown asst. secretary. It was decided that the officers and some other members should define and develop standards for coöperative medical practice and these standards have now been published.

1. The plans must provide medical care and preventive medicine given by and built around the general practitioner.

2. The operation of the plans shall not impose restrictions on the physician as to methods of diagnosis or treatment and shall not interfere in the physician-patient relationship.

3. The plans must have available equipment and facilities adequate to ensure full performance of the services arranged for or provided, and in general to provide a high quality of medical care.

4. The compensation of the physicians must be adequate and commensurate with accepted standards for the community served.

5. All plans shall be equitable and consistent with respect to the rights and obligations of subscribers and physicians, and shall describe specifically the types and amounts of health services to which the subscribers are entitled.

6. All medical services shall be rendered by or under the direction of graduates of recognised schools, duly licensed to practise medicine and where possible members of appropriate professional societies. All specialists' services shall be rendered by physicians qualified in the particular field. All nursing services shall be rendered by or under the direction of graduates of recognised training schools, duly licensed to practise nursing.

7. The plans must be economically sound and have financial status and operations which adequately protect the interests of subscribers and physicians.

8. The rates must not be excessive or inadequate.

9. After the first year of membership, statistical records must be maintained and reports must be submitted currently as prescribed by the federation.

10. A profit-making sales organisation shall not be given responsibility for promotion or administration. Promotion and administrative policies shall be dignified in nature and in a manner consistent with professional ideals.

The enforcement of these standards is in the hands of a group of visiting experts. The final decision of the board of directors as to whether a particular organisation may be accredited within the federation is made on the recommendation of this accrediting committee of experts after consideration of their report. It is interesting to see how careful these reformers are to eliminate the risks of group practice described so eloquently by your special commissioner in his "Battle of the Clubs" forty years ago.

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BIGGER AND BETTER SHELTERS.—The A.R.P. Coördinating Committee, under the chairmanship of Prof. J. B. S. Haldane, was one of the first consultative bodies to propose heavily protected shelters, and the Government's technical experts recently approved the committee's designs for communal shelters which could be rapidly constructed. On Sept. 17 a deputation from the committee was received at the Home Office, and put forward a plan to secure a large and immediate increase in the production of cement. The Haldane shelters, advocated by the committee, would entail the use of large quantities of cement, the output of which could be increased by 50% if the committee's recommendations are adopted. No action has so far been taken, but to be useful these measures must be initiated soon. The committee also suggest that tunnel shelters could be used to supplement the Haldane shelters, and propose that bunks should be put up in the underground stations to increase their capacity; these bunks could be transferred to the shelters as they are completed. Additional tunnels, they think, could be driven with the help of unemployed miners, from the tubes or into hillsides, and existing tunnels could be converted, as at Southwark and Ramsgate. They suggest a survey of steel-framed and reinforced concrete buildings, whose basements and lower floors could readily be made safer than the standard forms of communal shelter now available.

# In England Now

*A Running Commentary by Peripatetic Correspondents*

MANY months before the start of the war owners of private houses up and down the country began to offer them for use as hospitals should the need arise. When war actually broke out these offers were multiplied a hundredfold. They were activated by all sorts of motives, some noble, others not so noble, and it is to be feared that in the first flush of enthusiastic gratitude many offers were accepted that would have been better declined with thanks. It is always difficult to look a gift horse in the mouth and politicians appear to find it even more difficult than ordinary mortals. It was considered desirable (or politic) that the wives of owners of private-house hospitals should be given an opportunity of taking part in their administration, and these good ladies were encouraged to act as commandants, an arrangement which as might have been anticipated has not always been attended with the happiest results. Commandants and matrons have not all seen eye to eye, but at least it has been secured that the matron is solely responsible for the nursing care of patients.

There must by now be hundreds of private houses of widely varying size and suitability equipped with a certain amount of medical impedimenta, all anxious to make a better show than their neighbours. This rivalry reveals itself in many ways—anxiety to treat acutely ill patients as distinct from convalescents, to be provided with an operating theatre, to be graded as of one-hundred bed capacity, and to admit patients directly. These private-house hospitals are rarely suited for the treatment of acutely ill patients and still more seldom are they capable of doing operative surgery under conditions that give either staff or patients a decent chance; but the urge to make a brave show is compelling, though nearly all the commandants realise that their neighbours' houses are suited only for the reception of convalescents. On the outbreak of war the commandant of one auxiliary hospital in our area, who had set her heart on dealing with acutely ill patients, was asked to take instead a hundred defective children from one of the cities. This did not fall in with her wishes at all and she spent a frenzied day telephoning to friends and neighbours in an attempt to get someone else to take the unwanted children, but to no purpose. At last she telephoned to the other end of the country to the house of a kinsman who happened to be in Alaska and told his butler to prepare to receive the defectives; the kinsman's feelings on his return can be left to the imagination. The hundred-beds fetish has its origin partly in the glamour of good round numbers and partly in the belief that this line marks a demarcation between one scale of personnel and salaries and another. All sorts of efforts are made to secure the desired quota, particularly where the reasonable capacity of the house falls between 75 and 80; but even when the possibilities are obviously much lower there is still a reluctance to break 50, or 40, or 30 as the case may be.

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While the commandants of these auxiliary hospitals have certain general characteristics they vary widely in their attitude to orthodox authority, in their methods of getting things, and in their whole attitude to their hospitals. A few are prepared to accept without question official pronouncements on questions of equipment, others argue with officialdom by post, or more vigorously by personal assault, while the daring minority, exasperated beyond words or profiting by experience, get what they need where they can and argue afterwards. The two last groups sometimes give their administrative masters a headache, and it must be difficult for officialdom to know which it likes least, the verbally bellicose or the more direct. Both are likely to achieve their ends in time, for constant nagging wears away stones, even official stones; there is for the onlooker a certain malicious satisfaction in seeing the look of anguish greeting recognition that another commandant has joined the ranks of the Amazons, as when Mrs. A announces that she will ask the turbulent Mrs. B how she meets a certain difficulty.

Most of the country-house hospitals are not lacking in amenity. They have spacious grounds and gardens, sometimes a pond to fish, though their very distance from the fleshpots may make them rather dull for patients and staff alike. Many of the houses contain Old Masters and other treasures that have been left in situ, and it is interesting to study the reactions of patients to their new environment. One of our satellite hospitals is liberally hung with fine old pictures as well as the usual heterogeneous assortment of family portraits, and our welfare officer, anxious to improve the shining hour, asked a patient from Yorkshire how he liked living among them. "They were bloody funny at first," was the rather disconcerting reply in a dialect that I cannot reproduce, "but I soon got accustomed to them." We have always been intrigued by the beautifully painted text that adorns the walls of the bathroom in the same house—"Whatsoever thy hand findeth to do, do it with thy might." Generally, patients go to these auxiliary hospitals willingly enough, especially when they are to be in the first batch of patients at a new hospital, for there is a belief that is difficult to dispel that special celebrations mark the opening of a new hospital. Doubtless there will come a time when it will be necessary to pass patients from base hospitals to auxiliary hospitals at the earliest possible moment, but so long as pressure on our accommodation is not too propelling we find some reluctance on the part of our senior staff to send patients to these hospitals, partly because of a conviction that patients can be restored to fitness more quickly in our own hospital, and partly, doubtless, because of a natural reluctance to hand over interesting cases.

For general administrative purposes auxiliary hospitals are grouped round parent base hospitals under whose wing they are supposed to function and from which they will in the main draw their patients, though some admit directly cases of sickness from their immediate vicinity. The day-to-day care of patients is in the hands of a local practitioner, often retired from general work. These auxiliary hospitals have their own administrative problems, apart from that of dual female control already mentioned—the curse of having to cope with a plethora of Army forms, of paying soldiers, of trying to secure hospital clothing and of discharging patients from the Army. There are problems inherent in the convalescent state of the patients and their comparatively long stay in hospital—difficulties of providing adequate recreational facilities and of welfare activity, problems arising from the issue of passes and from efforts to provide certain forms of treatment in small hospitals, sometimes situated in awkward country. But such difficulties are not insurmountable and on balance auxiliary hospitals undoubtedly form a useful addition to the country's resources, provided they are used for functions for which they are suited. Events may well render them much more important than they are today.

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"Now," said the examiner in first aid to the local Lancashire candidate, "what would you do for a case of strychnine poisoning?" "Ah'd gie 'im starch," was the answer. "Now just think again," said the examiner. The local looked baffled, and his next-door neighbour whispered to him, "Tha's thinking of iodine poisoning." "By gum, ah am an' all," grinned the local, "if ah gave 'im starch, it 'ud nobbut stiffen 'im!"

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It is not easy to decide when for any one person the battle of London actually started. There had been so many raids labelled officially "over the Thames Estuary" that one began to wonder whether German planes would ever manage to penetrate the outer ring of defences. Then one afternoon, after inoculating some mice, I had gone out on to the flat roof of the laboratory for a breath of air. It was one of those clear bright days with a sky of that powder blue which only Canaletto seems to have faithfully reproduced in his pictures of eighteenth century London. No sound of planes could be heard, and in fact there was nothing to remind one of a war except the silvery balloons idly floating above like queer Oriental fishes. Suddenly a tall building half a mile away burst into flames and bellowed out clouds of smoke. A minute afterwards there began that queer noise of a hundred

cows that have mislaid their calves. A week later the blitzkrieg came to our very doors when, again before the song of the sirens, a bomb was deposited within a few feet of us. Ten yards further south and a now priceless collection of rhesus monkeys would have ceased to be of any further value for scientific research, but as it was the bomb after penetrating the pavement vented its fury on the water mains and only a single pane of glass was broken.

Every day since then, as one comes out from the station, the streets more and more resemble those of Ypres in 1915–16. And yet, to the bird's eye or possibly the Junkers-Messerschmitt view, there is surprisingly little change in London. St. Paul's and Westminster Abbey, the Houses of Parliament, Highgate Church and even Pentonville stand as they have stood for years. London in these early autumn days is still what she was to William Dunbar four centuries and more ago, "the flower of cities all." Whether London was ever "small and white and clean," as William Morris suggests, seems doubtful and there are lovelier cities by far—Edinburgh, Florence, Paris, New York. If only certain buildings, some of Gilbert Scott's pseudo-Gothics for example, could alone be selected for bombing all would be for the best. Yet even if all London were battered to the earth the spirit of her people would be unconquered. One of my laboratory assistants went home the other night to find his house without its roof, large holes in the walls and a time bomb in the road, so that nothing could be salved or saved. Worse still, his family had vanished into the blue and for more than twenty-four hours he could find no trace of them. When he turned up to work again, a little haggard but still as bright as ever, his only comment was "Well, I've seen many pictures of refugees in the last year or two. I didn't realise how easy it is to become one yourself."

* * *

This censoring of letters helps to fill up my time in those grey northern seas. My job is not to stop the professional spy—he wouldn't give me a chance—but the babblings of young men who in most cases that need my scissors are amiably trying to make their letters interesting. When this job was first thrust on me I often felt I was trespassing on holy ground, later I went through a stage of being bored, and now I skim through the letters almost mechanically, my eye automatically halting at name of place or ship, mention of movements or direction, or of incidents of war. This selective quality of eye and brain to notice certain classes of objects and be blind to others is remarkable. Coming back to London once after years at sea I spotted a tree sparrow feeding with house sparrows on Westminster Bridge and was pleased with myself, but I had completely failed to notice that during my absence they had built the County Hall. Later, on a passenger ship, I tried to improve my poor powers of observation by noticing one class of object each trip—e.g., hair, fingernails, patent medicines in cabins on morning inspection—and I always found something interesting which would certainly have been missed if it hadn't been for this purposeful observing. On the trip when I "did" eyes I spotted a passenger with ochronosis; I cultivated him and even had to play bridge without stakes with him before I was sufficiently acquainted to get his story and a specimen of his urine, which gave that rich chocolate colour with Fehling. As a young man he had been rejected for life assurance, but had appealed, and been sent to Pavy, who immediately recognised the condition and allowed the appeal. He had some kyphosis like Osler's Maryland cases. The trip I did ladies dresses ended in disaster. On the way to Sydney the captain got a wireless from the company's agent in Auckland which we had just left: "Is Miss —— aboard, height 5 ft. 7 in., dressed in ——." When I went up to report the captain was talking about it to the purser, who was pointing out that there were 800 passengers aboard. "I suppose you don't know anything about her, Surgeon?" Dark blue dress with pink cuffs and collar, that was easy. "She's sitting on the starboard side of the promenade deck amidships," I said, and felt like S. Holmes, Esq. Later when the purser approached her she burst into tears; she had no ticket. She was a waitress in a restaurant in Auckland and had been serving two of our stewards there. "How lovely to go to sea," she had sighed. "Come with us," they said hospitably. She did, but her parents missed her and her Sunday dress, and made inquiries. After she had spent five days at a police station in Sydney we had to take her back, and the two stewards, both rather friends of mine, were sacked. I doubt if these observing exercises improved my powers of observation. I am still just as blind to things that don't interest me and mechanically spot things that do.

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My young nephew collects stamps and shows a very definite evolution in the matter. Time was when high-coloured South Americans would lure him; we might almost call this the jackdaw stage. Somewhat later came a passion for sets (bower bird), and now it is Britain and British possessions only, which seems to indicate that well-defined territorial sense so marked in the robin. When I was a senior boy at school, we of the sixth used to worship from afar the great Asquith, and read his speeches. He had a trick of introducing a rare or obsolescent word from time to time, which sent us scurrying to the dictionary. I think we got a certain sense of companionship with our idol and also a sense of power from sharing with him the meaning of these words. At any rate one unconsciously started collecting them, and my collection has evolved on homely lines into phrases, strange thoughts, and aphorisms. The soul of collecting is classification, and here are a few specimens from my page for the miscellany of country practice: a parson explaining he was a poor preacher, "I'm no good in the wood"; a devout woman describing the clean smell of chrysanthemum leaves, "just like our Lord's washing must have smelt." I got rather a good one last week from a charming old Sussex worker, talking of his boyhood, "most days we had ten-to-one pie." Of course my collection isn't written—it only exists as cobwebbed bottles in my cortex. My professional page inevitably smacks of Gee: a nurse's remark, "What lovely complexions the colotomies have," or a surgeon's, "When I see a waxed moustache, I always have a Wassermann done." I expect this stamp has a later edition of lighter colour or different watermark, which connects those side-whiskers affected by some young men with a diplococcus, but I haven't got it yet, and spurn forgeries.

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It was in 1936 after a trip to Germany that I first realised that another war was inevitable. As a result I and my small family moved from the proximity of power stations to the outermost ring of suburbs. Fifteen miles out and some four hundred feet up the Great Wen is only just beyond a low range of hills. Without realising it we had taken dress-circle seats for the nightly performance of the battle of London. The overture usually starts crescendo and diminuendo on the sirens, while the arrival on the scene of the gentleman who has been christened by my children Herr Ponk is the signal for the leit motif, the voice of London "whose artillery with tongue may not be told"—strange how modern Dunbar can be. The whole mise-en-scène with its queer lighting effects and sudden unexplained bangs and screams is strangely Wagnerian with a dash perhaps of the later Strauss. All that is wanted to complete the allusion is to have Adolf and Hermann singing in the foreground, Adolf in a blonde wig doing his best to look like Wotan, with Goering, who obviously has the right presence for the part, in the rôle of Brunhilde. I have been cured of any desire ever again to sit through a cycle of The Ring. There is however one snag about having a front-row seat for the battle of London. Although the Nazis have repudiated Max Reinhardt and all his ways, they are apt occasionally to ape his technique and to draw little or no distinction between the spectators and the stage.

As I wrote these words in what should have been the still hours of the night there were five resounding crashes. The house shook to its foundations and the French windows in the dining-room burst open. After a few minutes in which to allow Herr Ponk to get off stage I reached for my tin hat and ventured out to inspect the damage. The casualties were many—more than two hundred I believe—but the victims were beyond all human aid. They were my neighbour's prize Leghorns.

# Letters to the Editor

## INFANTS IN DAY NURSERIES

SIR,—At the request of the Minister of Labour, the Minister of Health has asked certain local authorities to provide day nurseries for the children of women employed "in munitions and other factories which are essential to the war effort," explaining that "arrangements of this nature are required to facilitate the recruitment of the large number of additional women workers urgently needed without jeopardising the well-being of the children."

If these day nurseries were intended solely for "toddlers" the two Ministers would have earned our warm congratulations, but since infants aged one month and over are also to be admitted the scheme, in that respect, is open to severe criticism. As a result of many painful experiences every pædiatrician is aware of the danger of infection to the young baby, and has come to realise that the only adequate safeguard against this danger is to prevent that intimate and indiscriminate contact with other infants, children and adults which is almost certain to occur in these nurseries. Moreover, it is often difficult to persuade mothers to breast-feed their infants, a difficulty which will be increased by the apparent endorsement of artificial feeding by the highest official authority in the public health.

I was so concerned about these two aspects of the Ministry's scheme that I wrote to Sir Arthur MacNalty (chief medical officer to the Ministry) about them and also asked him if it was the considered policy of the Ministry of Health not merely thus to abstain from encouraging breast-feeding, but actually actively to discourage it. In the absence of Sir Arthur his deputy Sir Weldon Dalryple-Champneys sent me a full and courteous letter explaining the position of the Ministry. In the course of this letter he says that "every effort is made to separate such infants from toddlers," and gives a description of the means by which this will be done; furthermore, he states that "our view has been that the right place for young children is with their mothers, at least to the end of the breast-feeding period." Since that is the view of the Ministry, it is somewhat surprising that local authorities were not advised that children should not be admitted to day nurseries until the breast-feeding period was over—i.e., until the child was nine months old. Possibly, if strong enough representations were made to the Minister of Health, he might even yet issue such advice, and it is for this reason that I have addressed this letter to you and for the same reason I have brought the matter to the notice of the war emergency committee of the Royal College of Physicians.

The official unemployment figures do not reveal any shortage of female labour, but I understand that such figures are unreliable because, owing to the unequal distribution of the workers, there are certain areas where there is a dearth of female labour. It would, however, be interesting to know whether the dearth of skilled munitions workers in any area is so great as to make the employment of mothers of infants under nine months of age essential, since this group can only represent a relatively small fraction of the total number of female workers.

Birmingham, 15. LEONARD G. PARSONS.

## TREATMENT OF WAR NEUROSES

SIR,—In the controversy on this subject insufficient attention has been paid to the differing circumstances in treating early cases near the front line and treating more chronic cases at the base hospitals. During over four years of the last war I had extensive experience of both types of work, and I found that a different mental attitude and a different line of approach on the part of the army medical officer were called for in the two situations. Early cases responded well to firm though kind treatment, by short methods of persuasion and explanation, and by the rapid recovery of "lost" memories in a state of muscular and mental relaxation. Adherence to strict military discipline and attention to the preservation of fighting morale were adjuvant factors in this treatment, and its success was proved by the return of about 70% of the cases to the firing-line after an average of a fortnight's stay in the casualty-clearing station or stationary hospital. Out of 2000 to 3000 cases which I saw on the Somme between autumn 1916 and spring 1918, only 3% were malingerers and 11% were psychotics. The men sent back to the line included soldiers of proved courage, and the great majority of them stood up to fighting conditions afterwards.

On the other hand, more chronic cases such as I saw at Maghull Military Hospital in 1915 and at Craiglockhart War Hospital in 1918 needed more prolonged and detailed psychotherapeutic treatment, by the methods of deep mental analysis and autognosis, and the majority of them were found to be unfit for front-line duties or were invalided out of the service. It would probably have been better for the state and for themselves if they had never been taken into the service—with certain outstanding exceptions. As the war proceeds the need for trained psychotherapists will become ever more apparent.

WILLIAM BROWN.

Institute of Experimental Psychology, University of Oxford.

SIR,—May one engaged in general practice support the pleas published in your columns for the intelligent and coördinated treatment of the various forms of war neurosis, both in civil and military life? I have recently seen two soldiers, home on leave, who were severe and untreated cases of this kind. In each instance they were admitted to a military hospital; in each instance they returned to me a few months later having received no treatment whatever, so far as I could ascertain, for their real and serious disabilities. The longer these cases go untreated the more difficult they become to treat. These unfortunates are wasting their own time and the country's money and are being demoralised. Little notice appears to be taken of any report sent forward by a general practitioner to the military authorities. The patients seem to be treated as a rule "by studied neglect" and regarded with hostility by the military doctors.

Exactly the same is happening to many civilian cases, both male and female. As medical referee to a sick-benefit society I see numbers of untreated cases of war neurosis, most of which appear to be remediable. I agree with the proposal for the setting up of military rehabilitation centres. The essence of cure is social rather than personal therapy. The problem of the civil cases must be dealt with by our profession; otherwise it will certainly be dealt with by the creation of a new profession, outside our ranks, to the permanent impoverishment of medical practice.

Worcester. HOWARD E. COLLIER.

SIR,—I am interested in Sir Arthur Hurst's remarks on my letter. I should be still more interested to learn which "simple forms of psychotherapy" he would advise in the three cases I quoted. One was simply cured, after other "simple" measures had failed elsewhere. The others, victims of therapeutic and diagnostic naïveté, are cases needing highly specialised methods. Sir Arthur is mistaken if he reads into my letter any suggestion that the simple acute neuroses are difficult to treat. Delay and diagnostic error are the factors I would wish to see eliminated. The self-confidence of the inexpert physician may produce some good results. It will certainly produce many bad ones. If a specialist is available, why not use him?

St. Mary's Hospital, Paddington. GEORGE PEGGE.

## PSYCHIATRY AND THE WAR

SIR,—Almost every Friday afternoon it was (and possibly still is) customary for the staff at Cardiff mental hospital to meet to discuss the week's work. On these occasions my old chief, Edwin Goodall, used to preface the proceedings by saying: "Now, there's talk . . . and there's work."

Almost every Friday morning since this war began I have been forcibly reminded of the sagacity of his aphorism by the remarkable quantity—not to say quality—of the psychiatric material which finds its way into one or another of the medical publications. We have had a wide variety of views paraded before us on the

subject of "war neurosis" whatever that may be. Not having seen a case myself, although practising in an area which receives many evacuees and not a few service patients, I gather that it is on the one hand regarded as the result of impounding the narcissistic libido and on the other it may, consistently enough, be taken to be a curious neurophysiological syndrome known as scrimshanking. It is never by any chance a straightforward condition of schizophrenia, paranoia, G.P.I., or mental deficiency. There must have been a noteworthy mutation of clinical type, for these unambiguous diagnoses cover the vast majority of psychiatric cases remaining from the last war, many of whom continue to be under treatment in the only places which are capable of treating them—namely, the ordinary unglamorous and largely ignored mental hospitals of the country. Twenty years ago the writers of the day called these conditions "shell shock" or "neurasthenia," but with the passage of years the true diagnosis in intelligible terms of ordinary psychiatry became so insistent that it was in many cases entered in the records as it should have been in the first place had there been more work and less talk. Nowadays apparently you are not allowed to be shocked by a shell, but it is quite legitimate to become neurotic because of the war.

Innate suggestibility coupled with immature character development is a condition necessarily precedent to the development of a great many neuroses, and if there is one thing which is likely to be the very coping stone of the ætiological factors necessary to build up a neurosis it is the suggestion contained in the expression *war* neurosis. In the name of reason, why *war* neurosis? Why not war pneumonia, war influenza, war diphtheria, war pellagra or even war amenorrhœa? For the war is just as likely to be an ætiological factor in these conditions as it is in psychiatry. Of course this innate suggestibility cuts both ways, because at least one successful therapist believes that the less you know about psychiatry the more quickly you can cure a neurosis, presumably by suggesting to the patient that, as you cannot understand it, it therefore cannot exist. All you have to do is to fill the hospital, mobile unit or what-not with doctors who know practically nothing about psychiatry, and the patient is cured almost before his name has been entered on the bed-card. This is a pleasing notion, and when we psychiatrists have been driven out of business by our lack of ignorance I must remember to try it on a series of dermatological cases, as I think it must be quite pleasant to be a dermatologist and I know nothing about skins except that they seldom grace your columns, even in the guise of war-impetiginous states.

However, enough of this talk. I must to work, in the hopes that many of your psychiatric contributors will join me in getting on with the job and will resolve to offer their material to your editorial discretion only when they have some facts to add to our knowledge and are capable of stating them without the pathetic controversial setting which so often mars, if it does not actually obscure, useful records of experience. The fact seems to emerge that war psychiatry is no more different from peace-time psychiatry than war medicine as a whole is from peace-time medicine as a whole, and it is a fundamental mistake in approach to any problems which may present themselves to suppose otherwise. New clinical types do not suddenly arise because of war conditions. The colouring may change a little, and the relative incidence perhaps of the various states, but at heart it is still the same psychiatry that some of us have been pegging away at for a good many years.

Stone, Bucks. IAN SKOTTOWE.

## CORONARY INFARCTION

SIR,—At the risk of being dubbed a pedant may I plead for adherence to a more precise terminology in reference to that cardiac catastrophe and its sequelæ which have recently received the new and meaningless title of "coronary infarction"? The causative condition is widely and correctly known as acute coronary occlusion, and this may be due to coronary thrombosis or more rarely to coronary embolism. Its result, when not immediately fatal, may be *cardiac infarction*, either gross or molecular. "Coronary occlusion," therefore, should be used to describe the initial condition of acute reflex sympathetic shock, with its associated arrhythmias, and "cardiac infarction" to denote the sequel of fever, pericardial friction and electrocardiographic changes. Thus strictly it is incorrect to talk about T1 and T3 types of coronary thrombosis. The absence of these phenomena does not rule out a clinical diagnosis of coronary occlusion, but suggests that infarction of the heart has not followed. The diagnoses clearly carry different implications, coronary thrombosis implying only coronary artery disease but cardiac infarction damage to the myocardium as well.

A similar confusion of thought and terminology breeds in students the mistaken notion that tenderness and rigidity are signs of an acute abdominal catastrophe. In fact, the only non-specific signs of the latter are those of reflex abdominal shock; tenderness and rigidity indicate that peritoneal reaction has developed.

Lambeth Hospital. H. E. MANSELL.

## DEATH AND DYING

SIR,—Professor Ryle's article of Sept. 28 is doubtless purposefully provocative and you will perhaps allow me to be purposefully provoked.

No man, I think, writing on death and dying can be such a diehard as to preach a negative philosophy in A.D. 1940 in total disregard of such advocates of immortality as Socrates, Cicero and Jesus. One must presume that anyone who holds himself equal to pronounce on ultimate things has at least familiarised himself with the Platonic dialogues. Professor Ryle, therefore, must have for his own purposes repressed these authorities from his mind. But when he writes that religion and superstition (note this conjunction of terms) have persistently aggravated fear, is he asking his readers similarly to repress from their minds the examples of men who, like Socrates, have passed through the phase of death without fear, because (or in spite) of their conviction of the immortality of the soul?

Why should we be asked to base our attitude towards these matters on the reactions of those to whom death means annihilation rather than life? Certainly not because their names have lasted longer in history, for the contrary is manifestly the case. Yet it is common knowledge that the poor patient, even when not reinforced by any clear conception of Christian doctrine, does not, any more than did Shelley, believe in death. Anyone who seems to himself to *know* that physical death is the end of the individual must in his own light be wiser than Socrates, and indeed wiser than Shakespeare, and we should possibly wish to hear more from such a source. But the assumption that action is healthy and thought morbid seems wearisomely typical of a generation hypnotised by what Joseph Conrad called "the illusion of activity."

Hothfield. MARTIN O. RAVEN.

## REFERRED PAIN

SIR,—In your leader of Sept. 28 a viewpoint which I and others have found helpful is not noted; surely all perception of pain from deep structures must be referred and therefore poorly localised. As I have pointed out elsewhere the evolution of the species is general and the sensory nervous system in particular is not likely to cater for improbable pathological experiences. Only the superficial structures can therefore be expected to be endowed with that necessary perception of noxa which we call pain, in order that such noxa may be avoided, and the life of the individual be perpetuated. The interior should never come in contact with such noxious stimuli and therefore cannot be expected to possess a sensory innervation to deal directly with them.

If differences in tension or toxins of infecting material irritate the nerve-endings in viscera or deep structures, then either direct neural or chemico-neural stimuli pass via the vegetative system to the spinal or medullary-thalamic centres in autonomous connexion and thence stimuli flow out through the sensory nerves belonging to the myotomes in neural connexion with the irritated focus. This is Mackenzie's conception, but he appears not to have realised why it must be so. The skin, subcutaneous tissues and the superficial muscles must be able to perceive noxious impacts and express them in a manner which takes precedence of all other sensations—

i.e., as pain. These tissues can and do localise such noxa accurately. But when the deeper structures throw out distress signals there is the likelihood of autonomic spread-over to several spinal or other centres and the localisation will tend to be diffuse and not accurately localisable. The knowledge of the possible sites of registration of irritation from deep structures is of diagnostic value.

For example, the pain of angina pectoris is perceived mainly by sensory fibres traversing two or more of the following left-sided muscles—scalenus anticus, triangularis sterni and anterior end of the fifth intercostal. Irritation of these nerve-endings by pressure will at once evoke an attack of angina if subliminal irritation is present in the myocardium. But if these sites are previously anæsthetised with novocaine, or amyl nitrite be inhaled, no pain follows the procedure; only sweating and pallor. Either of these manœuvres will prevent angina following effort procedures known to be provocative of it without such pre-treatment. Thus the pain felt from a possibly small patch of ischæmic myocardium is diffused to widely spaced subcutaneous sensory nerve-endings.

Bristol 8. A. T. TODD.

## COMBATING SLEEPLESSNESS

SIR,—I do not think enough use is being made of bromides to combat the sleeplessness of air-raids. People have been coming up to see me in the morning shaking and anxious and saying "It's no good, I can't go on and I must be evacuated." I've said, "Take three doses of this before bedtime, and see me tomorrow morning." And a large proportion of them have been able to carry on. Most of them have dyspeptic symptoms, so I give them bromide in a bismuth mixture with some rhubarb in it. I have found the ordinary doses quite useless, but most people can take gr. 30 of sodium bromide three times a day or a single dose of gr. 30–60 quite easily. These large doses are very salt and need watering down, but a draught of water afterwards will completely wash away the taste. A dose of gr. 30 three times a day will make most people face what is going on calmly and sleep well of a night. It does not prevent them from waking up and becoming immediately alert when the need arises, and it does not leave them with a heavy head in the morning.

Merton Park, S.W. TAYLOR HARRIS.

## SOIL FERTILITY AND HUMUS

SIR,—In response to your invitation (*Lancet*, July 20, p. 83) to produce evidence that Guernsey cows and other livestock show a preference for fodder grown on soils rendered fertile by humus, I should like to state that this has already been done. The matter is referred to in Sir Bernard Greenwell's paper published in the *Journal of the Farmers' Club* of February, 1939. Further evidence on this subject will be found in my recent book "An Agricultural Testament" (Oxford University Press). Many of our most observant farmers are aware of the value of animals in synthesising, as it were, the factors which matter in nutrition. The grazing animal invariably prefers the produce of soil in which humus is being prepared naturally from vegetable and animal wastes underneath the turf to produce on similar soil where some factor such as want of oxygen or of animal wastes are preventing humus formation.

In countries like France, where the women are intensely table-proud, the superiority of vegetables grown by means of farmyard manure over the produce raised by artificials is almost universally recognised. When the women of England, who as a body might be described as house-proud rather than table-proud, acquire the knowledge possessed by their sisters in France a great advance in the nutrition of our population will take place. In the meantime much can be done by private individuals and institutions by dividing their vegetable areas into two parts: one manured by farmyard manure or humus, the other by means of chemical fertilisers. The great differences in keeping qualities, in taste and in satisfying power between these two classes of produce will form a good foundation for the nutritional studies of the future.

Blackheath, S.E.3. ALBERT HOWARD.

## E.M.S. SALARIES

SIR,—I have carefully read Sir Ernest Graham-Little's letter and eventually gathered he was pleased that certain advice he gave over a year ago regarding the establishment of the E.M.S. was about to be taken, although, regretfully, only as regards one special group. Being in that special group I was naturally interested in this vindication of Sir Ernest's judgment, and wondered if he would care to offer some further advice on a problem which has been troubling me for some time, and seems likely to become even more urgent when his prediction is fulfilled. Lest it be thought that my professional principles are on a lower plane than Sir Ernest's, it is permissible to indicate that I fully accept the voluntary principle of medical attention of the sick poor, and that at no time did I seek to avoid this, as my membership of the staffs of three voluntary hospitals proves. In common with many other consultants I found myself allocated to the E.M.S. (although I had answered the B.M.A. memorandum in terms indicating I was freely available for any surgical work abroad or at home), and thus prevented in the early stages of the war from easing my boredom by joining the Armed Forces. Later this boredom became insupportable, and I accepted the offer to come out on part-time work, and also obtained permission to join the Forces, if possible. I then found the latter almost impossible of achievement. It was clear even before the war that London was likely to become a "depressed area," and I doubt whether any E.M.S. scheme which did not involve full-time work and pay would have been accepted by most of the younger consultants. In that case they would have been able to join the Army as consultants with majorities, and fill the vacancies now occupied in many cases by their own house-surgeons and registrars. (The R.A.M.C. found it difficult to get men at the beginning of the war when most of the London consultants were in the E.M.S.) Their contracts would have then gone on until the end of the war, although they would now have as little to do as the E.M.S. men a year ago. Surely one service is as good as another, and if the Armed Forces retain their men, so should the E.M.S., or at any rate men unwanted in the E.M.S. should be drafted into the Forces as required by expanding establishment. However, if this is not conceded as a principle, why should the brunt of the Treasury attack fall upon those men who found boredom insupportable? Class 1 is class 1 whether or not any individual is whole or part-time, and the class should be considered as a whole, especially as the very job for which it was organised is now at hand.

It is urged, and I feel sure Sir Ernest is in agreement, that every unnecessary person should leave London, and most have not lingered upon the urging. It can be no secret from Sir Ernest that this includes largely the people whose private fees make possible the consultant's acceptance of the principle of voluntary hospital service. My acceptance of this principle is still intact. I also agree that anyone who need not live in London should get out of it lest he become a needless casualty. Apparently, the Treasury say that the reward of abhorrence of inactivity is an occasional sessional guinea, whereas the willingness to be bored is to be compensated by a continuation of the tenure of service.

Speaking as a younger consultant, my private practice has now almost completely disappeared; my whole-time services are not wanted; my part-time retainer is to be discontinued, or reduced, or perhaps even abolished. Please, Sir Ernest, how am I to exist in order to continue to accept the voluntary principle?

Wimpole Street. MAXWELL ELLIS.

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ROYAL COLLEGE OF SURGEONS OF ENGLAND.—Demonstrations of museum specimens will be held at the college, Lincoln's Inn Fields, London, W.C.2, this month on Mondays and Fridays at 3 P.M. Today, Oct. 11, Mr. C. E. Shattock will speak on tumours of bone, and on Oct. 14 on tumours of the kidney. On Oct. 18, 25, and Nov. 1, Dr. A. J. E. Cave will show anatomical specimens, and on Oct. 28 Mr. R. Davies-Colley will show specimens illustrating inflammation of bone. The course is open to advanced students and medical practitioners.

# Public Health

## CEREBROSPINAL FEVER IN SUSSEX

REPORT ON 20 CASES

BY MATTHEW HUNTER, M.B. Edin., D.P.H.

THESE notes refer to a series of 20 cases, treated at an infectious-diseases hospital, of which all but 2 were admitted in 1940. There was 1 death and only 3 cases had major complications. This compares favourably with the results published in THE LANCET (1940, 2, 216 and 196) from Wrexham (19 deaths in 154 cases; 12·3%) and Croydon (7 deaths in 31 cases; 22·6%). The ages ranged from three to fifty years. All the cases were either severe or moderately severe, and in view of the mortality in the last epidemic (1915–16–17) I find it hard to believe that many patients would have recovered without chemotherapy.

There was a rash in 4 cases, but only in 1 was it really typical. Meningococci were isolated from the cerebrospinal fluid in 16 cases but were not typed. In the remaining cases there was no reason to doubt the clinical and laboratory diagnosis. The standard treatment was M. & B. 693 in the dosage advocated by Banks and adopted later by the Ministry of Health.[1]

| Age in years .. .. .. | 0— | 2— | 5— | 10— | 15+ |
|---|---|---|---|---|---|
| Daily amount in grammes .. | 3 | 4½ | 6 | 7½ | 9 |

This amount, divided into four-hourly doses, is given four-hourly for the first 3 days, and thereafter gradually reduced over the next 4–6 days.

Antimeningococcal serum was given to 6 cases either intravenously, intramuscularly or intraperitoneally, in addition to their M. & B. 693. It was only given intrathecally to 1 patient. No patient was treated with serum alone; 2 patients treated with serum and sulphanilamide had a "stormy passage." Lumbar puncture was carried out fairly often for the reduction of pressure, alleviation of symptoms, and as a check on the success or otherwise of the treatment. A single diagnostic puncture may suffice for mild cases, but repetition appears to be of definite value in the severe ones. In 12 cases treatment had been begun prior to admission to this hospital, a fact which has a bearing on the varied lines of treatment, and possibly on the complication-rate.

Of the complications, 1 patient developed almost absolute unilateral nerve deafness; 2 had effusions into the elbow-joint which settled down without requiring local interference; 1 knee-joint required several aspirations, and despite long rest in bed the effusion always recurred with weight bearing and a walking calliper was required; 2 cases given M. & B. 693 soluble before admission developed ulcers of the buttock, one of large size; 2 cases were given M. & B. 693 soluble intrathecally (also before admission). The first, a youth of nineteen, stated that his left leg became numb after the injection, and soon he exhibited a drop foot—a typical anterior-horn-cell lesion. This was six months ago, and improvement is very slow. The second, a woman of forty-eight, was given M. & B. 693 soluble intrathecally at the initial lumbar puncture; subsequent punctures failed to withdraw any C.S.F. and although she was too ill and irrational to give an account of her symptoms it appeared that her legs became increasingly weak until she died on the fourth day. No autopsy was performed. This was the only death in this series. Thrower[2] has drawn attention to the high alkalinity of the sodium salt of M. & B. 693 and the necrosis of muscle it may produce when introduced intramuscularly. These two cases suggest that the compound should not be given intrathecally.

The impressions gained from this series are:—

1. That adequate doses of M. & B. 693 produce a rapid improvement in symptoms, and a low mortality. It is much superior to sulphanilamide. The only toxic reactions were cyanosis, nausea and one rash, which small doses produce to the same if not to a greater extent.

2. Antiserum seemed to be of value in very severe cases and those not showing the usual rapid improvement with M. & B. 693.

3. The intrathecal administration of M. & B. 693 soluble is undesirable, in spite of the lag between administration by other routes and the attainment of a maximum concentration of the drug in the C.S.F.

I wish to thank Dr. Rutherford Cramb for permission to publish this report, and Dr. G. C. Gundersen for his help with the cases.

1. See *Lancet*, 1939, 2, 921 and Ministry of Health Memo. 234/Med.
2. Thrower, W. R. *Proc. R. Soc. med.* 1940, 33, 555; see *Lancet*, 1940, 1, 967 and 1090.

# Panel and Contract Practice

### The London Air-raids

INTENSIFICATION of aerial attack on London, resulting in the damage or demolition of many practitioners' surgeries, has led the panel and insurance committees to issue an appeal to every practitioner on the insurance panel. Those already approached have been standing by their unfortunate colleagues who have been bombed out and the others are invited to assist by attending any person who claims to be insured whether that person is on his list or not. Insurance prescriptions and certificates should be supplied to such applicants without charge. At a meeting of the London insurance committee on Sept. 26 it was reported that the appeal had met with a wide response. Not a single voice had been raised against it. It was reported at this meeting that four London insurance practitioners had been killed.

### Supervision of Sickness Claims

Commenting on the effect of regional medical service on the supervision of claims for benefit the *National Insurance Gazette* admits the moral effect of the service and its convenience in securing a second opinion. It had in fact become the custom not to strike a member off the sick fund (when the society was not satisfied about his total incapacity) without an examination by the R.M.O. This has led to a belief on the part of insured persons that their society could not put them off the sick fund without such an examination. This was of course erroneous. A society is entitled to act upon the evidence in its possession and if that evidence shows that the claimant is no longer totally incapacitated the society is entitled to cease payment notwithstanding the fact that the insurance practitioner continues to issue weekly certificates. Again, when a second medical opinion is obtained, whether from the R.M.O. or from an independent medical referee, the society is not bound by it. It is the society's responsibility, not that of R.M.O. or medical referee, to decide whether or no the claimant is entitled to benefit. Should an appeal be lodged it is not against the medical decision, but against the decision of the society which has to appear in the character of respondent. The *Gazette* suggests that sickness visitors can do much to assist societies to view claims in their proper perspective, and pleads that sick visitation should be regarded as complementary and not inimical to the medical certification system. There is, however, an essential difference: the practitioner is dealing with an insured person as a patient, weighing whether it is in the interest of the patient's health that he should return to work forthwith or whether the risk of further illness would be reduced by an additional period of convalescence. Some approved society administrators are obsessed by the words "incapable of work"; if an insured person so certified is found digging for victory in his garden he is at once put down as a fraud. The doctor knows that a person may be capable of gardening but that he ought not to return to work until his recovery has become consolidated. The R.M.O. could be trusted to consider the medical as well as the administrative aspect of cases referred to him and this useful service should be reinstated at the first opportunity. Meanwhile many societies are arranging for independent medical examinations in cases where they are in doubt.

The distinguished service cross has been awarded to Temp. Surgeon Lieutenant (now Temp. Surgeon Lieut.-Commander) W. B. D. Miller, R.N.V.R., for gallantry and devotion to duty in operations in Norway.

# Obituary

## FREDERICK GEORGE THOMSON

M.A. CAMB., M.D. LOND., F.R.C.P.

Dr. F. G. Thomson, who collapsed while visiting a patient on Sept. 25 and died almost immediately, had lived and worked for nearly forty years in Bath. After a brilliant career as a student at Cambridge he entered Middlesex Hospital where in 1899 he obtained first-class honours in the London M.B. and later the gold medal for his M.D. thesis. He held the post of senior demonstrator of physiology and biology at the Middlesex and also house-appointments at the hospital before in 1900 he became medical officer in charge of the British Hospital at Oporto. Here he built up a private practice and remained till 1906 when he settled in Bath. He soon gained a high reputation as a general physician and specialist in rheumatic diseases, and was appointed consulting physician to the Royal United Hospital and the Royal Mineral Water Hospital, and later to the British Red Cross Clinic in London. His writings were chiefly on rheumatic diseases and his book on Chronic Rheumatic Diseases, which he wrote in collaboration with R. G. Gordon, ranks high as a scientific and practical treatise. When the British Medical Association met at Bath in 1925 he was elected president and he chose as the subject for his address the evolution of a spa. He was also the first president of the section of physical medicine of the Royal Society of Medicine when it was formed in 1931 by the fusion of the sections of balneology and electrotherapy.

*Herbert Lambert, Bath.*

Thomson of Bath (for so he was known to his contemporaries) was one of a group of physicians who raised the practice of physical medicine in the spas from pure empiricism to its rightful place in therapeutics. He felt that the medical student is taught little about hydrology while the general practitioner often regards it vaguely as something unorthodox and a little suspect. In his Physiology and Principles of Hydrology (also written jointly with R. G. Gordon) Thomson tried to help the practitioner to decide for himself when hydrotherapy would be of benefit to his patients. And when the British Health Resorts Association met at Bath in 1937 he urged them to sponsor a series of scientific investigations into the physiological properties of mineral waters. The spas need men of his stamp and many who worked with him will miss a genial colleague.

## ARTHUR PERCY DODDS-PARKER

B.M. OXFD, F.R.C.S.

Mr. Dodds-Parker died at Oxford on Sept. 22. By his death the Oxford medical school has lost not only one of its best but one of its best loved sons. Coming up to Magdalen College in the late '80s, writes P. N. B. O., he proved his metal at once by getting into the university boat in the days of Guy Nickalls, and after taking an arts degree he studied medicine first at Oxford and then at Middlesex. Returning to Oxford in 1897 he started his career there as a demonstrator of human anatomy under his great friend the late Prof. Arthur Thomson and subsequently as a surgeon to the Radcliffe Infirmary. "A.P.," as he was called, will be affectionately remembered by the large number of Oxford medical men who passed through his hands as reader in applied anatomy or learned the elements of surgery from him at the Radcliffe. He was a most successful teacher, always emphasising the basic principles of his subject without undue elaboration of detail. As a surgeon, during the first twenty years of this century, in particular, he commanded a leading position in both city and county. His careful methods and sound judgment, added to a great measure of human understanding and generosity, were quickly appreciated by all who had occasion to consult him. After his retirement he found time to serve on the city council where his medical knowledge and common sense proved useful. Throughout his life he was a man of action rather than of theory—a keen sportsman, good at golf, fishing and shooting. In his later years he showed an increasing interest in the arts and became an authority on the museums and art collections of Oxford and London. A wide circle of friends will mourn his loss.

## THOMAS CLARKE

M.D., M.CH. R.U.I., J.P.

Dr. Thomas Clarke, who died at his home in Liverpool last month, was one of the senior magistrates on the city bench, to which he had been appointed in 1897. He was born in co. Antrim in 1846 and qualified from Queen's University, Belfast, in 1871. His work as a ship's surgeon brought him to Liverpool, and in 1875 he was appointed medical officer at Brownlow Hill workhouse. The following year he became honorary physician to the Liverpool Consumption Hospital, a position he held for thirty years, and later medical officer to the education committee. He decided to settle in Liverpool and about this time set up in practice at Edge Hill. He often recalled how in his first two months he earned less than £1, but his practice soon developed and he attended patients as far afield as Manchester and Southport. Later his son, Dr. T. Courtenay Clarke, joined him in partnership.

Dr. Clarke's wish to implement reforms in the services of the city led him to seek election to the council of which he became a member in 1895. He was elected an alderman in 1901 and resigned in 1903. As chairman of the port sanitary and hospitals committee he was able to do much to obtain proper hospital facilities for infectious diseases and he was largely responsible for the rebuilding at Mill Lane and the acquisition of the Fazakerley estate where the present hospital now stands. Dr. Clarke was also for many years chairman of the old West Derby parliamentary division. He was a prominent freemason and in 1888 served as provincial grand registrar. He had seven sons and four daughters, of whom two sons and three daughters survive him.

## RUPERT WELPLY

M.R.C.S.; CAPTAIN, R.A.M.C.

Captain Rupert Welply was killed in action at Dunkirk last May. He was born in 1911, the only son of Dr. George Chinnery Welply of Forest Gate. He qualified from St. Bartholomew's Hospital in 1938 and after acting as dresser to Mr. Reginald Vick joined the R.A.M.C. He was awaiting orders to sail to Bombay for five years when war broke out, and he was sent instead to France, where he was attached to the R.A.S.C. headquarters.

## BETTY MARGARET ZEAL

M.B. LOND., D.P.M.

Dr. Margaret Zeal was lost in the Atlantic when the *City of Benares* was torpedoed on Sept. 17. She was educated at St. John's School, Bexhill-on-Sea, and at Bedford College, London, and she took the M.B. in 1934 from University College Hospital. She held house-physician's appointments at the New Sussex Hospital and the Infants Hospital, and was house-surgeon at the Victoria Hospital for Children. After working on psychiatry and child guidance at the Maudsley Hospital, she took the D.P.M. and held the post of assistant medical officer at Horton for a year. Her work with a child-guidance fellowship at the Canonbury Clinic was interrupted by the war, and she went to the British Postgraduate Medical School as house-physician to the children's department at Hammersmith Hospital, where she later became obstetric house-surgeon. She still held

this appointment when she obtained leave to sail with the refugee children.

A colleague writes: Dr. Zeal was capable, intelligent, quick-witted and a first-class clinician, and her combination of psychological and pædiatric experience tended, naturally, to make a good house-physician. But what made her a resident of the first order was her own character. She was thorough and conscientious in a quiet and efficient way which showed no signs of fussiness or lack of proportion. She could do anything with children, and she was always careful to consider the feelings of both patients and relatives. Her sympathy was disciplined by her psychiatric training and she had none of the submissive weakness which sometimes goes with a sympathetic character. She had a healthy vein of firmness, and when she had once made up her mind that she was right she was capable of holding her own. Outside working hours she was a lively and cheerful person and an asset to any collection of residents. She was both liked and respected by everyone who knew her, and it is the loss of people like her which brings home the senseless iniquity of war.

## PLENTIFUL OR ESSENTIAL DRUGS

### FINAL HINTS TO PRESCRIBERS

BY far the longest of the three categories into which the advisory committee (see *Lancet*, Sept. 14, p. 340 and Oct. 5, p. 432) has divided the items of materia medica commonly used is the group of drugs "which are readily available at present or are regarded as essential." No attempt has been made to distinguish between those which are essential and those included because they are readily available. Chemical products predominate in the list, which is not surprising since most of the vegetable drugs have to be brought to this country by sea, while most of the chemical products are made at home.

The following vegetable substances are, however, included.

Acacia, aloes, aniseed, balsam of peru, belladonna leaves and root, benzoin, camphor, cardamoms, catechu, cinnamon, coca leaves, colchicum corn and seeds, colocynth, colophony, derris, digitalis, dill seed, ephedra, ergot, ginger, hyoscyamus (*niger* and *muticus*), isphagula, kino, male fern, menthol, mustard, nux vomica, opium, quassia, rhubarb (*Rheum palmatum*), scoparium, senna, stramonium, tragacanth, and certain oils: aniseed, cade, castor, cinnamon, clove, dill, eucalyptus, hydnocarpus, peppermint, theobroma and turpentine.

Chemical and mineral substances included are:

Acids: acetic, acetylsalicylic, ascorbic, benzoic, hydrochloric, hydrocyanic, lactic, mandelic, oleic, salicylic and tannic; acriflavine; ammonium carbonate and chloride; amyl nitrite; antimony compounds; arsenic trioxide; barbitone with phenobarbitone and hexobarbitone and their sodium salts; barium sulphate; benzyl benzoate; bismuth (precipitated); brilliant green; bromethol; bromides; calcium salts; carbon tetrachloride; carbachol; Chiniofon; chloral hydrate; chloramine; chlorbutol; chlorinated lime; chloroform; copper sulphate; creosote; cresol; cyclopropane; erythrityl tetranitrate; ether; ethyl chloride; formaldehyde; gold compounds; guaiacol; hexamine; hydrogen peroxide; ichthammol; iodoxylum; iron preparations (ferri percholor., ferri et ammon. cit., ferri carb. sacch., ferri sulph., iron, reduced iron); indicarmine; kaolin; leptazol; magnesium trisilicate; mersalyl; methyl salicylate; neoarsphenamine; nikethamide; paraldehyde; phenacetin; phenol; phenolphthalein; pyroxylin; quinine salts; resorcin; silver nitrate; sodium salts (benzoate, bicarbonate, chloride, nitrite, phosphate and acid phosphate, salicylate and sulphate); sulphanilamide; sulpharsphenamine; sulphur; thymol; trinitrophenol; urea; zinc chloride and sulphate.

The following alkaloids and similar substances are included:

Adrenaline, amylocaine hydrochloride, atropine, benzocaine, cocaine, codeine, diamorphine, emetine, ephedrine, homatropine, hyoscine, physostigmine, procaine, quinidine sulphate, strychnine, theobromine and theobromine sodium salicylate, theophylline, and theophylline with ethylene diamine (identical with Aminophyllin and Euphyllin).

In some cases the names of identical substances are given in the list; this is done for:

Atebrin (mepacrine hydrochloride), Avertin (bromethol), benzedrine (amphetamide), Dial (allobarbitone), Doryl (carbachol), Evipan (hexobarbitone), Medinal (soluble barbitone), Nembutal (pentobarbital sodium), Plasmoquine (pamaquin), Prominal (phemitone), Per-Abrodil (diodone), Yatren (Chiniofon).

The remaining entries are:

Ext. pituitarii liq.; ext. fellis bovini; extract of suprarenal cortex; insulin; injectio hepatis; pancreatin; papain; gelatin; cacao butter; and iodised oil.

It is clearly the view of the committee that no doctor need hesitate to prescribe any of the substances enumerated.

## MEDICAL WAR RELIEF FUND

THE object of the fund is the relief of financial distress arising as a direct result of war conditions. The collection of the fund is in the hands of a committee consisting of the officers of the British Medical Association, the presidents of the Royal Colleges of Physicians, Surgeons and Obstetricians, the chairman of the Charities Committee of the B.M.A. and the president of the Royal Medical Benevolent Fund which is coöperating in its distribution. Eligible for relief is any registered medical practitioner who is a British subject and who is domiciled in England, Wales, Scotland, Northern Ireland or the Channel Islands, as well as the wife or other dependant of such practitioner as the committee may determine. Applications for assistance should be addressed to the hon. secretary of the fund at B.M.A. House, Tavistock Square, London, W.C.1. Contributions to the fund should be made payable to the Medical War Relief Fund and sent to Dr. G. C. Anderson, hon. treasurer of the fund, at the same address.

### LIST OF SUBSCRIPTIONS RECEIVED UP TO OCT. 7

£72—Honorary staff of the Radcliffe Infirmary, Oxford.
£60—Honorary medical staff of High Wycombe War Memorial Hospital.
50 guineas—Dr. J. C. Matthews (Downton) and Prof. G. Grey Turner (London).
£50—Anonymous.
25 guineas—Sir Thomas Barlow (London), Dr. J. W. Bone (Luton), Sir Maurice Cassidy (London), Dr. H. Guy Dain (Birmingham), Sir John Fraser (Edinburgh), Dr. Thomas Fraser (Aberdeen), Mr. N. Bishop Harman (London), Lord Horder (London), Sir Robert Hutchison (London), Mr. Hugh Lett (London), Sir Ewen Maclean (Cardiff), Dr. W. Paterson (Harlesden), Dr. Henry Robinson (London), Prof. Wm. Fletcher Shaw (Manchester), Mr. H. S. Souttar (London), and Sir Beckwith Whitehouse (Birmingham).
£25—Dr. B. E. A. Batt (Bury St. Edmunds), and Dr. D. G. Greenfield (Rushden).
20 guineas—Viscount Dawson (London), Mr. E. Lewis Lilley (Leicester), and Sir Cuthbert Wallace (London).
15 guineas—Prof. C. F. Illingworth (Glasgow) and Dr. R. Thin (Edinburgh).
12 guineas—Dr. J. A. McClintock (Church Stretton).
10 guineas—Sir Adolphe Abrahams (London), Dr. Janet K. Aitken (London), Dr. F. M. B. Allen (Belfast), Dr. G. C. Anderson (London), Dr. W. Arnott (Oxford), Sir Girling Ball (London), Prof. Seymour Barling (Birmingham), Dr. C. L. Batteson (London), Mr. Victor Bonney (London), Mr. L. R. Braithwaite (Leeds), Sir John Broadbent (Wendover), Mr. L. R. Broster (London), Dr. J. A. Brown (Birmingham), Prof. A. H. Burgess (Cheadle), Sir Farquhar Buzzard (Oxford), Dr. J. I. Cameron (Glasgow), Mr. V. Zachary Cope (London), Dr. R. W. Craig (Edinburgh), Dr. W. Allen Daley (London), Prof. Stanley Davidson (Edinburgh), Mr. Gordon Gordon-Taylor (London), Dr. F. Gray (London), Dr. E. A. Gregg (London), Prof. E. W. Hey Groves (Bristol), Dr. L. L. Hadley (Birmingham), Mr. A. J. C. Hamilton (Inverness), Mr. R. M. Handfield-Jones (London), Mr. W. Sampson Handley (London), Mrs. K. Bishop Harman (London), Colonel W. L. Harnett (London), Colonel L. W. Harrison (London), Dr. W. F. T. Haultain (Edinburgh), General R. Heard (Edinburgh), Dr. N. G. Horner (London), Sir Arthur Hurst (Oxford), Mr. Cecil A. Joll (London), Sir Robert Kelly (Liverpool), Dr. J. F. Lambie (Glasgow), Sir Walter Langdon-Brown (London), Sir Kaye Le Fleming (Wimborne), Dr. L. MacQueen (Glasgow), Dr. G. W. Miller (Dundee), Dr. Egbert Morland (Aylesbury), Sir George Newman (Harrow Weald), Mr. L. E. C. Norbury (London), Mr. W. H. Ogilvie (London), Dr. Gilbert Orme (London), Drs. H. C. and E. A. Campbell Orr (Wolverhampton), Prof. Harry Platt (Manchester), Dr. H. W. Pooler (Ashover), Sir Humphry Rolleston (Haslemere), Mr. A. H. H. Sinclair (Edinburgh), Dr. P. B. Spurgin (London), Colonel H. Letheby Tidy (London), Dr. Agnes F. Turner (Dumfries), Dr. G. de Bec Turtle (London), Mr. H. P. Vellacott (Plymouth), Mr. Cecil P. G. Wakeley (London), Sir James Walton (London), Dr. S. Wand (Birmingham), Dr. Donald Watson (Bradford), Sir Alfred Webb-Johnson (London), Prof. R. J. Willan (Newcastle-on-Tyne), Dr. J. A. Williams (Birmingham) and Sir Charles Wilson (London).

£10—Dr. T. M. Davie, Dr. E. M. Dimock (Broxbourne), Mr. C. M. Kennedy (Plymouth), Dr. A. V. Ledger (Plymouth), Dr. Colin D. Lindsay (Plymouth), Dr. T. H. G. Shore (Plymouth), Dr. G. Stoddart (London), and Dr. N. E. Waterfield (Little Bookham).

6 guineas—Dr. G. H. McCulloch (Birmingham) and Dr. Cyril Prance (Plymouth).

5 guineas—Dr. P. H. Abercrombie (London), Dr. P. E. Adams (London), Anonymous, Dr. R. H. Balfour Barrow (Winchester), Dr. A. Beauchamp (Birmingham), Dr. A. H. Bradley (Leicester), Prof. E. Bramwell (Edinburgh), Dr. P. Martin Brodie (Edinburgh), Dr. C. Daniels (London), Dr. J. Forrester (Glasgow), Dr. A. Goodall (Edinburgh), Dr. R. G. Gordon (Bath), Dr. F. E. Gould (Birmingham), Dr. F. W. Grant (Jarrow), Dr. J. V. Grant (Birmingham), Dr. K. Harrower (Glasgow), Dr. R. A. Hickling (London), Dr. J. Hutchinson, Dr. L. A. Hutchinson, Mr. A. Jacobs (Glasgow), Prof. R. W. Johnstone (Edinburgh), Dr. R. Y. Keers (Murtle), Dr. J. G. McCutcheon (Glasgow), Dr. Peter Macdonald (York), Dr. A. S. M. Macgregor (Glasgow), Dr. W. F. McLean (Haddington), Prof. C. McNeil (Edinburgh), Dr. H. A. Mason (Derby), Dr. Douglas Miller (Edinburgh), Dr. J. B. Miller (Bishopbriggs), Dr. H. T. Nixon (Liverpool), Dr. R. W. Payne (Plymouth), Dr. A. P. Phillips (Kidderminster), Dr. J. J. Powell (Bristol), Sir D'Arcy Power (London), Colonel A. H. Proctor (London), Dr. W. T. Ritchie (Edinburgh), Dr. E. M. Rooke (London), Dr. F. A. Roper (Exeter), Dr. A. Senior (Thames Ditton), Dr. M. G. Sheldon (Birmingham), Dr. W. B. Silas (London), Dr. Harold Sington (London), Prof. Sydney Smith (Edinburgh), Dr. Herbert Spencer (London), Mr. R. Scott Stevenson (London), Sir Frederic Still (London), Dr. W. E. Thomas (Ystrad Rhondda), Dr. C. B. F. Tivy, Dr. R. S. Tooth (Lewes), Dr. H. M. Traquair (Edinburgh), Dr. H. Ward-Smith (Hereford), Dr. W. N. West-Watson (Bradford), Dr. G. A. Wilkes (Birmingham), Dr. John Young (Edinburgh), and Dr. R. F. Young (Glasgow).

£5—Dr. H. W. Boake (Dorking), Dr. Elizabeth Bolton (London), Dr. W. H. Brown (Glasgow), Prof. E. P. Cathcart (Glasgow), Dr. W. H. Cowper (Kingsbridge), Dr. W. L. Cuthbert (Stirling), Mr. W. McAdam Eccles (London), Dr. T. Watts Eden, Dr. J. C. M. Given (Tunbridge Wells), Dr. T. P. Heffernan, Dr. S. Hunt (Derby), Dr. L. Kilroe (Rochdale), Dr. T. J. Kirkpatrick (Derby), Dr. G. H. Letchworth, Dr. A. Lyndon (Hindhead), Dr. E. McCulloch (Plymouth), Dr. J. J. McMillan (Melrose), Dr. J. Milne (Manchester), Dr. H. B. Milsome (Chertsey), Dr. T. T. P. Murphy, Colonel C. Max Page (London), "Panel of 1273," Plymouth Medical Society, Dr. Mabel Ramsay (Plymouth), Dr. S. M. V. Richardson (Cheltenham), Wing-Commander T. S. Rippon (London), Dr. W. K. Simmonds, Surgeon-Commander J. C. Sinclair, Dr. J. Smalley, Dr. J. E. Square (Plymouth), Dr. W. L. Templeton (London), Dr. C. Thackray (London), Dr. Elizabeth Thompson, Dr. R. Walker, Dr. L. O. Watt, Mr. A. Hedley Whyte (Newcastle-on-Tyne), Dr. P. M. C. Wilmot (Plymouth), and Dr. E. Wordley (Plymouth).

4 guineas—Drs. A. M. and E. M. Ramsay (St. Andrews).

£4—Dr. H. G. Dowler (Gloucester).

3 guineas—Executors of the late Sir Gilbert Barling, Dame Janet Campbell (London), Dr. H. A. Clegg (London), Dr. H. H. Cohen, Dr. R. Creasy, Dr. W. W. Dawson (Wantage), Dr. A. V. Dill (Stroud), Dr. L. G. Glover (London), Dr. A. Gregory (Manchester), Dr. F. A. Hepworth (Saffron Walden), Dr. C. Hill (London), Mr. G. E. Larks, Dr. W. Lyle (Belfast), Dame Louise McIlroy (London), Dr. A. Macrae (London), Mr. A. Mitchell (Aberdeen), Drs. J. N. and O. N. Morris (Devonport), Dr. L. S. Potter (London), Dr. G. C. F. Robinson, Dr. A. C. Sharp (Harrogate), Drs. A. E. Struthers and R. Cochran (Paisley), and Dr. C. M. Young (Rickmansworth).

£3—Surrey Panel Committee in memory of the late Dr. P. V. Fry.

2½ guineas—Sir Henry Brackenbury (Hendon).

2 guineas—Dr. T. T. Apsimon (Bradford-on-Avon), Dr. N. H. Austin, Dr. A. P. Bertwistle (London), Dr. A. J. M. Butter (London), Dr. G. Lissant Cox (Preston), Dr. M. Cutcliffe (Torquay), Dr. Seymour W. Davies (Wirral), Mr. Norman Dott (Edinburgh), Dr. P. J. Filose (Fareham), Dr. R. Howarth, Dr. L. W. Jones (Llanfairpwll), Dr. R. Keene (Lowestoft), Dr. A. W. Kirkham (Southwell), Dr. W. E. Leishman, Dr. L. O. Lindsay, Mr. A. MacRae (Newcastle-on-Tyne), Dr. W. R. Martine (Edinburgh), Drs. Moul and Sinclair (London), Colonel W. S. Murphy (Douglas), Dr. G. S. Nicoll (Exmouth), Dr. F. W. Morton Palmer (Totnes), Prof. R. M. F. Picken (Cardiff), Mr. J. W. G. H. Riddell (Plymouth), Dr. G. B. Scott (London), Dr. F. M. V. Smith, Dr. M. Stein (Ferryhill), Surgeon Rear-Admiral L. Warren (Barrow Gurney) and Dr. R. Gordon Wilbond (Bristol).

£1 5s. 6d.—Dr. C. H. S. Horwitz (London).

1 guinea—Dr. Rosa Bale, Dr. C. D. Branson (Birmingham), Dr. Brown, Dr. G. Chambers, Dr. F. O. Clarke (London), Dr. T. W. Clarke (London), Dr. A. Cox (London), Dr. E. Cretney (Goole), Dr. G. J. G. Davidson (Lichfield), Dr. E. Davis (London), Dr. H. R. M. Denney, Dr. I. F. W. Edwards (Norwich), Dr. W. A. Frost (London), Dr. T. S. Hoy, Dr. W. Irving (Winchester), Dr. D. F. Johnstone (Plymouth), Dr. O. Marriott (Haywards Heath), Dr. A. L. Miles (Caernarvon), Dr. E. L. Monkhouse (Epping), Dr. A. C. Mooney, Dr. G. M. E. Olive (Southall), Dr. G. B. Page (Exeter), Dr. W. W. Shrubsall (Burgess Hill), Dr. S. Smith (London), Dr. Clara Stewart (Leeds), Dr. B. H. Stribling and Dr. S. V. Tinsley (Spennymoor).

£1—Dr. Josephine Heffernan, Dr. J. A. Master (London), Dr. A. Nathan (London), Dr. H. H. C. Reid and Dr. D. A. Richmond (Knutsford).

15s.—Dr. J. Shaw (Smethwick).

10s. 6d.—Dr. K. Davison and Dr. Mary Ross (London).

£20—Collected by Dr. Lorton Wilson (Barrow-in-Furness): Sir Matthew Fell, Dr. J. Livingston, Dr. H. F. Blacklee, Dr. A. E. Thompson, Dr. W. R. Bayne, Dr. P. Farmer, Dr. J. R. Turner, Dr. A. Rankin, Dr. J. C. Miller, Dr. G. E. Plowright, Dr. R. Fothergill, Dr. A. J. Cross, and Dr. L. Wilson.

LOCAL MEDICAL AND PANEL COMMITTEES.—£300—Birmingham; £250—Derbyshire; £200—Nottinghamshire; £150—Hertfordshire; £100—Gloucestershire, Leicestershire, North Riding of Yorkshire, Northumberland and Salop; £100 (stock) Warrington; 50 guineas—Southport; £50—Bedfordshire, Derby, Dorset, East Riding of Yorkshire, Herefordshire, Perth and Perthshire; £45 0s. 7d.—Midlothian; 25 guineas—Gateshead; £25—Caernarvonshire and Rotherham; £21—Rutland; £20—Greenock and Surrey; 10 guineas—Aberdeenshire; £10—Darlington; 5 guineas—East Lothian.

Total—£4282 6s. 7d. and £100 3½% conversion stock.

# Notes, Comments and Abstracts

## THE PURPOSE OF AUXILIARY HOSPITALS

To increase the hospital accommodation available for air-raid and military casualties and for military sick, the Ministry of Health have arranged that auxiliary hospitals should be established, for the most part in private houses, to receive post-operative, convalescent and other comparatively mild cases. They are to be regarded as E.M.S. hospitals, and at present the Ministry plans to establish ten or so of them in each county, except on the coast, where they will be fewer. In time the hospital officer or group officer will arrange for the main hospitals to be affiliated to certain auxiliaries so that they can send patients there directly. To prevent patients staying longer than is necessary in an auxiliary hospital it is proposed that service patients should not stay there for more than three weeks. At the end of that time, if not fit for discharge to their units or to a convalescent depot they will be sent back to the hospital from which they came. If a patient's medical officer thinks he would benefit by a further period in an auxiliary hospital he can send him back, but in the ordinary way the man will be fit, at the end of his three weeks, to go on to a convalescent depot for those who no longer need active treatment but still are not fit for duty. A depot has been established in each command, and patients may be referred there either directly from the main hospital or from the auxiliary hospital.

No auxiliary hospital will be used for the treatment of patients requiring surgical care unless it has been deliberately up-graded by the hospital or group officer by the allocation to it of additional personnel and equipment. In the ordinary way auxiliary hospitals will be staffed by one or two trained nurses assisted by V.A.D.s and attended by a visiting general practitioner. Those used for civilian casualties, however, will probably take cases requiring rather more treatment than auxiliary hospitals taking service patients, and will therefore receive visits from members of the medical staff of the main hospital; but the period of stay will still be limited to three weeks for each patient unless the visiting officer from the main hospital orders him another three weeks. Auxiliary hospitals will not ordinarily be available for the civilian sick, though this policy may be modified if need arises.

## ST. THOMAS'S HOSPITAL

As the result of three direct hits within a week, St. Thomas's Hospital has had to be the first of the great teaching hospitals to be evacuated. The decision to evacuate was taken with extreme reluctance, but the extent of the damage left no choice. Seven of the hospital blocks were entirely out of action, including the entire kitchens, the dispensary, which with all the drugs and dressings in the hospital was gutted with fire, and the emergency operating-theatres which had been constructed at the outbreak of war. In addition the final bomb, striking the centre of the building, completely severed all services such as water, gas and electricity, and it will be at least another month before even a makeshift heating apparatus can be constructed.

In spite of all this, it has been found possible to maintain some services. Full outpatient facilities are available daily, including casualty, X rays, and the V.D. department. A permanent medical and nursing staff is in residence and the honorary staff are attending daily. Fifty beds are being maintained for air-raid casualties in addition to ten beds for emergency civilian sick, and there is also a small maternity unit in which at least one confinement has been conducted each night. Negotiations are in progress with the sector officer to arrange for outpatients who require hospital treatment to be admitted to one or other of the sector hospitals.

## AIR-RAID CASUALTIES SURVEYED

IN his statement to the House of Commons on Oct. 8, Mr. Winston Churchill said that when we entered the war we expected air-raid casualties of anything up to 3000 killed in a single night and perhaps 12,000 wounded nightly. We had made hospital arrangements on the basis of 250,000 casualties. The real figures which he gave fortunately do not come up to expectations. Up

to last Saturday as a result of air-bombing about 8500 people had been killed and 13,000 wounded, and since the heavy raids began on Sept. 7 casualties had declined week by week from over 6000 in the first week to under 3000 in the last week. Though the destruction of property had been considerable it was less than we had expected before the war, and Mr. Churchill was able to announce a step forward in spreading the risk over the property of all classes. The Chancellor of the Exchequer has almost completed the preparation of a bill for nation-wide compulsory insurance against damage to property from the enemy's fire, which will be retrospective. It is also proposed to provide insurance against the risk of war damage for movable properties such as industrial plant and household effects.

### AN IMPROVED FACE MASK

Mr. T. W. ADAMS, A.Inst.P., has devised a modification of the face tent for oxygen administration described by Argyll Campbell (*Lancet*, 1937, **1**, 82). The mask is simple in construction and can be fitted and used without previous instruction or experience. As there are no valves there is no resistance to breathing.

The mask is shaped to fit the contour of nose and face; its moulded edge is covered with soft rubber tube, and it is held in position by an elastic band below the ears or by a light metal spectacle frame. The oxygen is conveyed to the mask by chromium-plated brass tubes, one on either side, at the level of the patient's mouth. The lower part of the mask is left open except for a strip of strengthening material. The total weight is about 2 oz. Rubber tubes join the oxygen inlet tubes to a Y piece connected with the flowmeter and oxygen supply. The pressure on the exit side of the flowmeter being very little above atmospheric pressure there is no unpleasant blast on lips or face; even at high rates of flow the movement is perceptible only as a pleasantly cool breeze. The reducing valve is fitted with a fine adjustment control. Any type of flowmeter can be used with the mask, but since there is no need to humidify the oxygen a dry type is to be preferred, such as the "gauge" or the "bobin" or the simple one described by E. P. Poulton (*Brit. med. J.* 1937, **1**, 1113). In an emergency the mask may be connected direct to the fine adjustment valve. Should special circumstances require the oxygen to be humidified it may be bubbled through the appropriate liquid contained in a Woulfe bottle placed between the flowmeter and the mask. The ventilation is sufficient to keep the mask reasonably free from carbon dioxide and to minimise the condensation of moisture on the mask. The mask is made by the Oxygen Tent Service (Medical Equipment Ltd.) of 1a, Beaumont Street, London, W.1, and can be obtained either separately or complete with reducing valve and flowmeter.

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RELIEF OF DISTRESS IN CHINA.—We learn from Mr. F. M. Osborn, who is collaborating with Dr. H. Gordon Thompson (late of Shanghai) on behalf of the British Fund for Relief of Distress in China, that there were 20 to 30 responses to the appeal (LANCET, 1938, **1**, 1021) to hospital authorities and medical men for any usable surgical instruments for which they had no further use. After the articles had been looked over and reconditioned they were dispatched to China along with a good consignment of new instruments. It is not possible now, he writes, to procure more new ones owing to other demands, but if any of your readers have any serviceable used instruments, &c., I would be pleased to receive them, have them cleaned, reconditioned and sent out. The Burma road, he adds, has not been closed for Red Cross materials—and anyhow it is soon to be reopened. They should be sent to him at 15, Endcliffe Hall Avenue, Sheffield 10.

## Appointments

BEATTIE, MARY, M.B. Belf., D.P.H.: temp. junior asst. M.O. for Nottingham.

WALKER, C. FERGUSON, M.D. Lond., D.P.H.: temp. asst. county tuberculosis officer and R.M.O. at Knightwick Sanatorium, Nr. Worcester.

WALLACE, W. B., M.B. Glasg.: examining surgeon under the Factories Act, 1937, for Lochgelly, Fife.

WEST, R. G. RANYARD, M.D. Lond., M.R.C.P.: junior asst. R.M.O. at Surrey County Sanatorium, Milford, Nr. Godalming.

## Medical News

### Consultant Scientists

To ensure the continuance of the fullest coöperation of scientific workers with the Government in the national war effort, the Lord President of the Council has appointed a scientific advisory committee. The members are:—

Lord HANKEY, chancellor of the Duchy of Lancaster (chairman); Sir WILLIAM BRAGG, P.R.S.; Dr. E. V. APPLETON, F.R.S., secretary of the Department of Scientific and Industrial Research; Sir EDWARD MELLANBY, F.R.S., secretary of the Medical Research Council; Sir EDWIN BUTLER, F.R.S., secretary of the Agricultural Research Council; Prof. A. V. HILL, F.R.S., physical secretary of the Royal Society; Prof. A. C. EGERTON, F.R.S., biological secretary of the Royal Society.

The terms of reference of the committee are: (*a*) To advise the Lord President on any scientific problem referred to them. (*b*) To advise Government departments, when so requested, on the selection of individuals for particular lines of scientific inquiry or for membership of committees on which scientists are required. (*c*) To bring to the notice of the Lord President promising new scientific or technical developments which may be of importance to the war effort.

### London Jewish Hospital Medical Society

Miss Muriel Landau will deliver her presidential address to this society on Oct. 20 at 3.30 P.M. at 37, Mapesbury Road, N.W.2. Members who wish to be present should notify the lay secretary at the hospital, Stepney Green, E.1, not later than Oct. 14.

### Medical Society of London

A general meeting of this society will be held at 11, Chandos Street, W.1, on Monday, Oct. 14 at 4 P.M., when Dr. Gordon Goodhart will deliver his presidential address. The title of the address will be Stray Thoughts on Pathology and Medicine.

### Course on Industrial Medicine

A fortnight's course on industrial medicine and hygiene will be held at the London School of Hygiene, Keppel Street, W.C.1, beginning on Nov. 11. It is intended for works medical officers, and part-time attendance can be arranged. Further information may be had from the secretary of the school.

### Service Casualty

Surgeon Lieutenant T. I. David, R.N.V.R., H.M.S. *Dundee*, has been reported missing, presumed killed.

## Births, Marriages and Deaths

### BIRTHS

ELLIOTT.—On Oct. 5, in York, to Dr. Lucy Elliott, wife of Captain Charles Elliott, R.A.S.C.—a son.

LONGRIDGE.—On Sept. 29, at Onchan, I.O.M., the wife of T./Major R. G. M. Longridge, R.A.M.C.—a son.

MACIVER.—On Oct. 4, at Weybridge, the wife of Major D. P. MacIver, R.A.M.C.—a son.

NORRIS.—On Sept. 28, at Lincoln, the wife of Dr. F. E. Norris—a son.

PLATT.—On Oct. 4, at Mill Hill, the wife of Dr. B. S. Platt—a daughter.

ROBIN.—On Oct. 5, in London, the wife of Mr. Ian Robin, F.R.C.S.—a daughter.

STEPHENSON.—On Sept. 27, at Maidstone, the wife of Surgeon Lieut.-Commander G. V. Stephenson, R.N.V.R.—a son.

TAYLOR.—On Oct. 1, in Bristol, the wife of Dr. Arthur Taylor—a son.

### MARRIAGES

DONALDSON—WHYLEY.—On Sept. 28, Malcolm Donaldson, F.R.C.S., of London, to Mia Whyley, of Bedford.

DURDEN SMITH—PERKINS.—On Oct. 4, at Northwood, Anthony James Durden Smith, M.B., to Dorothy Joan Perkins, M.B.

HAMILTON PATERSON—IM THURN.—On Sept. 28, at Castle Cary, John Hamilton Paterson, M.B., to Ursula Ysabel im Thurn, M.R.C.S.

PETCH—STIRLING.—On Sept. 20, in London, Charles Plowright Petch, M.R.C.P., to Margaret Stirling.

REDMAYNE—JEMSON.—On Oct. 5, in Birmingham, Paul Redmayne to Betty Jemson, M.R.C.S.

### DEATHS

LOCKHEAD.—On Oct. 7, in Edinburgh, James Lockhead, C.B.E., M.D. Edin., F.R.C.S.E., late senior medical officer at Gibraltar.

MALLINS.—On Sept. 30, at Farnham, Surrey, Henry Mallins, M.B. Dubl., late surgeon, I.M.D., aged 89.

REID.—On Sept. 27, in London, Robert John Reid, M.B. Edin., D.P.H., chief assistant school medical officer for West Ham, aged 58.

REYNOLDS.—On Oct. 2, at Bournemouth, Leethem Reynolds, M.B. Camb., D.P.H., Lieut.-Colonel, I.M.S. (ret.).

VAWDREY.—On Oct. 2, at East Horsley, Surrey, Theophilus Glascott Vawdrey, M.R.C.S., formerly of Plymouth, aged 89.

WATSON.—On Oct. 1, at Reigate, Surrey, Charles Henry James Watson, M.B. Edin., F.R.C.S.

WEIR.—On Oct. 5, at Brockenhurst, Hants, Hugh Heywood Weir, M.B. Camb., aged 65.